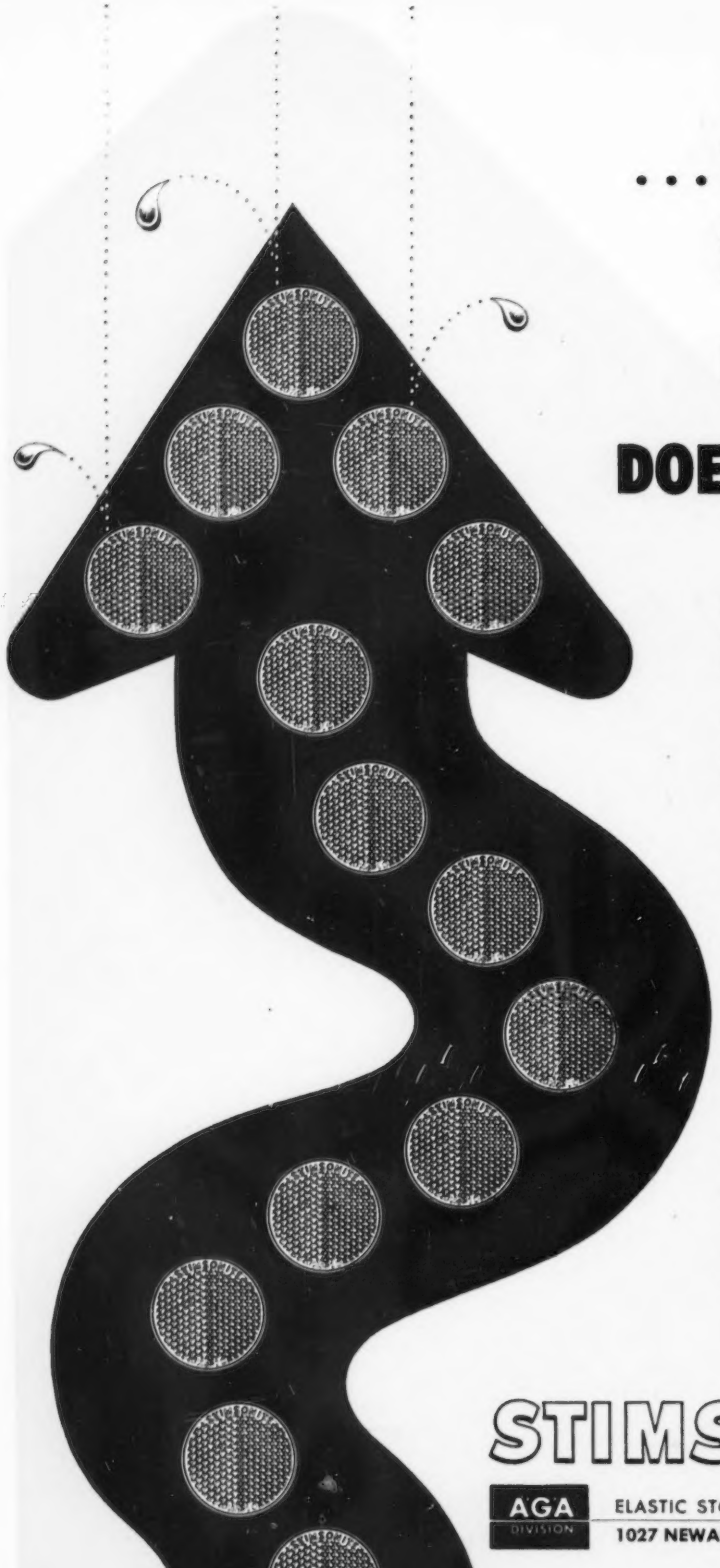
JANUARY, 1954

Traffic Engineering

Kansas City's Southwest Trafficway

- Public Opinion Survey Methods
- The Pennsylvania Turnpike Joint Safety Research Project
- Year-end Roundup of Toll Road Trends

Official Publication of the Institute of Traffic Engineers



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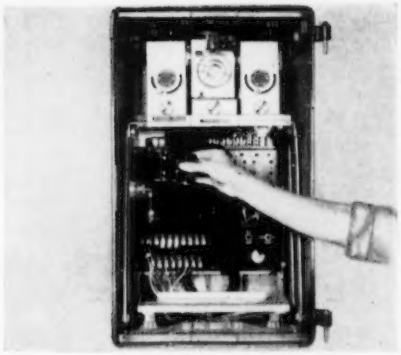
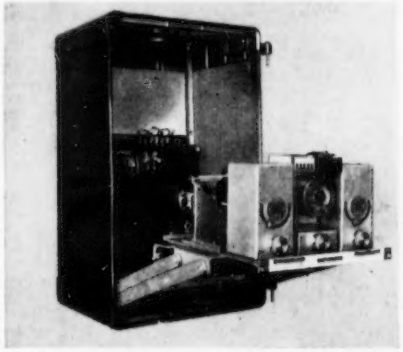
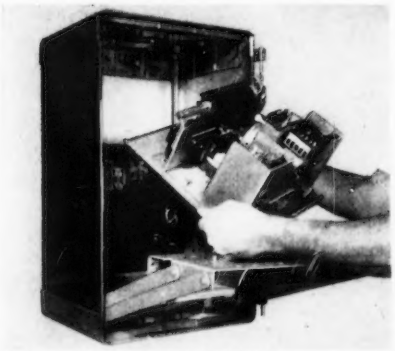


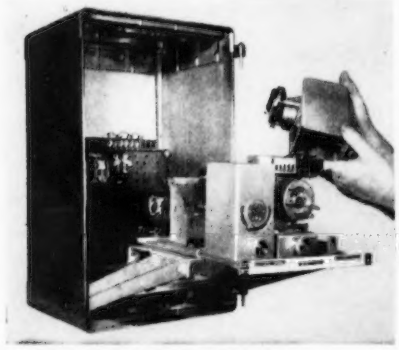
JACK-MOUNTED RELAYS make field servicing take less time—saves man-hours and labor costs.



TIMER SWINGS OUT on pantograph arms, for easy inspection and maintenance in the field.



TIMER IS EASILY REMOVED for fast servicing by just twisting two half-turn fasteners, unplugging Jones plug, and lifting.



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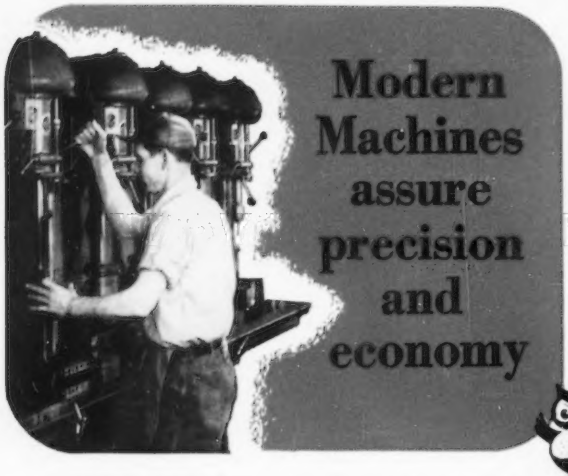

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Traffic Engineering

OFFICIAL PUBLICATION OF THE INSTITUTE OF TRAFFIC ENGINEERS

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COVER: The Southwest Trafficway project in Kansas City, Missouri, comprises seven separate sections and cost $5,800,000. Besides the main viaduct shown on the cover, there are four separate smaller structures providing grade separations and traffic interchanges. This roadway is 2865 feet long and is made up of several series of continuous I-beam and girder spans resting on 39 concrete bents and two abutments. See Traffic Products and News for another story on "Everything is up to date in Kansas City."

Traffic Engineering is that phase of engineering which deals with the planning and geometric design of streets, highways, and abutting lands, and with traffic operation thereon, as their use is related to the safe, convenient, and economic transportation of persons and goods.

May We Offer . . .

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Published Monthly by the

Institute of Traffic Engineers

PUBLICATION office:
Interstate Printing Corp.
400 Watchung Avenue
Plainfield, New Jersey

EDITORIAL AND ADVERTISING offices:
Strathcona Hall
New Haven 11, Connecticut

Entered as second-class matter November 7, 1941, at the Post Office at Plainfield, New Jersey, under Act of March 3, 1879. ¶Single copies 40 cents, subscription price $3.50 per year in the United States; $4.75 per year to foreign countries. Other publications of the **Institute of Traffic Engineers** include Annual Proceedings, Traffic Engineering Handbook and Technical Bulletins. ¶**The Institute is not responsible for any statements made or opinions expressed in its publications. Publication of advertising does not constitute Institute approval or endorsement of the products or services advertised.** Permission to reprint contents with customary credit line is given unless otherwise stated.

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Frankly Speaking

THE WEIGHTY PROBLEMS of finance inextricably tied to the relief of major physical deficiencies in highways, streets, and terminals, clearly are finding only partial solution in revenue-raising plans now in effect or under consideration. Earlier enthusiasm for the toll as a way out is being tempered by growing realization that this device has restricted applicability. Bond issues and increased user taxes, however well justified by the circumstances, are rarely popular, politically or otherwise, in amounts commensurate with the needs we seek to fill.

And the motor vehicle population and travel continue to swell with the leveling-off era still around the corner. Each comprehensive assessment of future street and highway requirements serves to make present inadequacies the more glaring. Long-range planning and endeavor that entertains only the philosophy of gradually building our way out of the current traffic scramble is not enough.

A fuller achievement will be preceded by recognition that the operating service factor is paramount. In this concept, all the miles of our street and highway networks earn attention. Without a miracle, major construction or reconstruction will proceed annually on a small percentage of the entire system, and these improved segments, no matter how small, will surely help. But the vast remaining mileage, judged by one criterion or another to be less critical from the standpoint of physical improvement, will, as always, continue to serve the bulk of our travel. Effective engineering provisions for this larger mileage cannot be shrugged off, if a maximum of operating service for the monies expended is the objective. The functions of traffic engineering reach directly toward the core of these extensive needs, as well as toward the refinement of operating service on the fewer facilities of more recent vintage.

Appropriate financing and support of competent traffic engineering for all our miles ought to go hand in hand with fiscal plans for constructing new facilities. In actual practice, however, the engineering or political eminence of a large street or highway construction program often tends to subordinate the potentials of traffic engineering in budget action. Greater wisdom will someday provide sufficient funds and professional abilities for higher standards of operating service to all the public concerned.

The quality of traffic engineering performance this year and in the future will have a significant influence on the administrative attitudes toward this issue and the advancement of traffic engineering.

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24th Annual ITE Meeting Paper

No. 6. The young traffic engineer and author of the following paper, John E. Baerwald, was selected by the Judges' Committee of Past Presidents as the recipient of the 1953 Past Presidents' Award Certificate

Public Opinion Survey Methods as Related to Certain Phases of Traffic Engineering

By John E. Baerwald (Jun. Mem., ITE)
Research Engineer,
Joint Highway Research Project,
Purdue University,
Lafayette, Indiana

PUBLIC OPINION has always had a dynamic effect upon the social, economic, and political trends. It influences the conduct of leaders, office holders, engineers, writers, inventors, and others. Thus, it can serve effectively as a means of evaluating policies and practices if proper survey techniques are applied to the problems under consideration.

Only within recent years have attempts been made to actually measure and evaluate the effect of public opinion. The results thus far obtained were accomplished by obtaining statistically controlled samples in a wide variety of opinion and attitude studies in several types of endeavor.

By determination of the attitudes of the public toward existing conditions, important trends can be determined. The 1950 United States Census is an excellent example of the use of this controlled sampling technique.

Predictions of future events and trends form the second major use of opinion survey techniques. The mistakes made in forecasting the 1948 general election seem to have been remedied. Accurate predictions of election results in New York, Canada, Australia, and England have since been made in which the average error has been held to about one percent of the final election returns (1).

The third major type of opinion and attitude studies include surveys directed toward finding new applications for existing opinion sampling methods; improving upon known techniques; and developing new survey methods (2). The study reported in this paper is of this type. The main objective was to investigate the practicality of applying public opinion sampling procedures to solving certain problems in traffic engineering. In order to do this, the following three general steps were necessary:

1. Design an effective, understandable, and efficient survey questionnaire.
2. Study various means of obtaining public cooperation in answering the survey questionnaire.
3. Determine the type and degree of analysis required to properly evaluate the data obtained in the survey.

"Open" and "closed" type questions were considered for use in the survey form. The open type is designed to give the respondent complete freedom in answering the question. The closed type limits the respondent to choosing one or more of several given plausible responses which, in his opinion, best answers the question. Closed type questions were mainly used in the survey questionnaire. This facilitated answering by the respondents and made possible more rapid tabulation of the results.

The main interest of this study concerns a method of obtaining traffic engineering data and as a result the questions were chosen to cover those phases of traffic engineering which would be most familiar to the respondent without requiring excessive deliberation or experience.

Three different methods of obtaining public cooperation were used in this study:

1. Employees of commercial service establishments, such as roadside restaurants and tourist courts, were asked to present the survey questionnaire form to the drivers they served.
2. Interviewers presented the questionnaire to the drivers.
3. Survey forms were mailed to various groups for distribution to their drivers.

Thus, it was possible to observe the effect of each method upon completeness of return and driver cooperation.

The completed questionnaire forms were tabulated by means of IBM mark sensing cards and summaries of replies to certain of the questions are discussed later in the report.

Previous Investigations

Opinion surveys have been used in recent years to determine public interest in certain phases of traffic engineering. Included among these is a study entitled, *The Public's Attitudes on Traffic Safety*. This survey was conducted in 1945 by the Opinion Research Corporation for the National Committee for Traffic Safety and dealt mainly with questions concerning traffic safety, enforcement, and education (3).

The American Institute of Public Opinion occasionally conducts surveys in the field of highway traffic which are reported in a syndicated newspaper column. A recent study contained questions pertaining to periodic physical examinations for motor-vehicle operators, ease in obtaining driver's licenses, and the maximum speed limit for automobiles on an "open-country" highway (4).

The types and amounts of highway mileage driven by various classes of motor-vehicle operators were studied by Iowa State College investigators. Questions concerning the driver's average speed and yearly mileage under day and night conditions were included in the survey. In addition, the respondents were asked to list, "Ten suggestions on

how to improve automobile driving and reduce highway accidents."

A survey conducted by the Missouri State Highway Commission used a different sampling technique. In order to obtain driver opinion on the "quarter-point" type of no-passing-line location, which the state had just adopted, prepaid return-address post cards were used to poll the drivers of that state. In this method, the drivers were asked to answer the printed questions and then place the post card in the mail. Over 25 per cent of the 12,000 questionnaire post cards distributed were returned. A majority of the respondents favored the new quarter-point-no-passing line and a yellow color for this line (5).

The prepaid, return-address post card method as well as personal interviews have been used to augment certain Origin-Destination Surveys and Cordon Counts made in conjunction with urban-traffic-planning studies (6, 7, 8, 9, 10, 11, 12, 13, 14, 15, and 16).

The personal interview technique has been used by the Virginia Traffic and Planning Division to obtain out-of-state drivers' opinions of Virginia (17).

In the study reported in this paper, three experimental questionnaires were distributed in the summer of 1949 to facilitate formation of the survey questionnaire form. These experimental forms made it possible to:

1. Improve the various questions from the standpoint of clarity and phrasing.
2. Test the method of obtaining data by having the operators of certain roadside businesses give questionnaires to their patrons.
3. Observe the reactions of the motor-vehicle operators to being polled on their highway-traffic opinions while they were enroute.

Distribution of Trial Questionnaires

The first questionnaires were distributed in the vicinity of Lafayette, Indiana. In order to obtain cooperation of as many non-local drivers as possible, four rural-truck-stops (combination gasoline station and restaurant sites) and three tourist courts were chosen as distribution points, because they had a large through-traveling clientele. The project was explained to the operator of each of these establishments. After the operator signified he was willing to cooperate, he was given some trial questionnaires with instructions for their proper completion.

Approximately one week later each of the sampling sites was checked. All of the survey forms were completed at two of the truck-stops. About 50 per cent of the forms were completed at a third truck-stop. None of the questionnaires were answered at the fourth truck-stop and at the three tourist courts.

It was interesting to observe the proprietor's comments on the driving public's reaction to the trial questionnaires. While good cooperation was reported by three of the truck-stops, the patrons of the tourist courts were quoted as saying that they did not have time to answer the questions or that their opinions were not of sufficient interest to warrant the completing of a survey form. It was also clearly evident that the truck-stop establishment with unanswered forms had made no real effort to distribute the questionnaires.

An adequate number of completed forms were obtained to validate the questions. Thus some questions were eliminated or modified and others were left unchanged.

The second trial questionnaires were placed in five Lafayette-area locations. They included the three truck-stops which proved successful on the first trial and two tourist courts. Forms were also placed in four truck-stops in northern Indiana for periods of 16 to 48 hours.

When the forms were collected from the Lafayette stations, only a small number had been answered. This was probably caused by the lack of cooperation of the sampling-site employees in distributing the survey forms to their patrons. Many drivers were reluctant or refused to fill out a second trial form because it was similar to the previous one that they had answered. Better results were obtained from three of the four northern Indiana stations where 250 forms had been distributed. Over half of the forms were completed. The third modification of the questionnaire received a limited distribution in the Lafayette area and in southwestern Indiana.

It became evident in these three trial distributions that when the operator and employees of the roadside distributing sites cooperated, the driving public was also willing to cooperate. Over half of the respondents took the time to write a note of appreciation on the questionnaire for having had the opportunity to express opinions on certain highway-traffic problems.

Distribution at the 1949 Indiana State Fair

The questionnaire actually used in the investigation was designed after careful study of the completed returns of each of the three trial forms.

The 1949 Indiana State Fair, held in Indianapolis from September 1 to 9, provided an excellent opportunity for obtaining a large sample of public opinion on traffic matters in a short time. Interviewing tables were placed in the Purdue University Educational Building and in the Indiana State Highway Commission Exhibit in the Industrial Building.

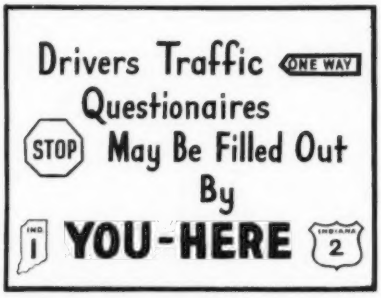

Fig. 1
Sign used for interviewing station in Purdue Building at 1949 Indiana State Fair.

A 16 by 24 inch sign, shown in Figure 1, was the only publicity used to obtain public cooperation. The sign was placed over the interviewing station in the Purdue Education Building.

Public interest was aroused by the sign and by such interviewer queries as: "Do you drive a car, sir?" or "How about you, Ma'am? If you drive we would like to have your opinion also." After the prospective respondents were convinced that it was not a test and that it was not necessary to sign their names, they generally were willing to fill out a copy of the questionnaire.

Of the 3,000 forms distributed at the two stations, 2,653 or 88 per cent were answered and returned. Of those returned 2,250 were filled out in the Purdue Education Building and 403 at the State Highway Exhibit. These replies constituted about 90 per cent and 81 per cent, respectively, of the forms distributed at the two stations. The larger number was obtained at the Purdue Building station where the exhibits were more educational than commercial and more room was available for answering questionnaires.

Distribution of Motor Vehicle Supervisor's Training Course

Through the courtesy of the Purdue Public Safety Institute, it was possible

to solicit the cooperation of the representatives of trucking companies attending the annual motor vehicle fleet supervisors training course held in Indianapolis, Indiana, September 12 to 16, 1949. A total of 1,746 questionnaires was given to 32 of the representatives for distribution among their drivers. Completed survey forms were returned by 209, and 329 additional forms were reportedly answered and mailed but were presumably lost in the mail. The fleet supervisors also reported that they had lost or misplaced 288 questionnaires. Thus there is an accounting for 47 per cent of the distributed forms.

Seventeen companies were asked to cooperate in the distribution of questionnaires to their salesmen in order to obtain a better cross-section of the motor vehicle drivers who use the Indiana highways for business purposes. Eight companies agreed to cooperate, one was unable to do so and the remaining eight firms did not acknowledge the request. Nearly 59 per cent (252 out of 428) of the questionnaires were answered.

With the cooperation of the Purdue University Agricultural Extension Service, it was possible to obtain the opinions of those who do considerable driving on all types of Indiana's rural roads. Two hundred and ten copies of the survey questionnaire were sent out to county agricultural agents and to home economics demonstrators. A total of 144 forms (69 per cent) were returned by the group.

Copies of the survey questionnaire were sent to members of the Highway Research Board Committee on Roadway Pavement Markings. They were asked to comment on the technique employed and many pertinent comments were received. The members were also asked if they would be able to distribute copies of the questionnaire in their respective states. Committee members from Iowa and Michigan were able to do so. Of the 200 forms distributed in Iowa, 135 were answered and 76 of the 100 questionnaires sent to Michigan were completed.

The number and classification of the 3,683 motor vehicle operators interviewed in this survey will be found in Table I.

The Joint Highway Research Project is continuing its investigation in this field. A revised form has been developed which may eliminate certain shortcomings of the questionnaire used in this study.

TABLE I
Distribution of Respondents

Classification	No. of Respondents	Classification	No. of Respondents
Total	3,683	AGE IN YEARS	
STATE		15-19	196
Indiana	3,133	20-24	537
Non-Indiana	550	25-29	718
SEX		30-34	576
Male	2,967	35-39	422
Female	716	40-44	437
OCCUPATION		45-49	293
Salesman[a]	426	50-54	194
Truckdriver[a]	441	55-59	127
Professional Person[a]	456	Over 60	97
Other[a]	736	No age given	86
Total Professional Drivers	2,059	YEARS DRIVING	
Farmer[b]	432	1 or less	102
Businessman[b]	107	2-3	164
Businesswoman[b]	39	4-5	223
Worker who drives to work[b]	276	6-7	271
Housewife[b]	333	8-10	484
Pleasure Driver[b]	425	11-15	668
Other[b]	12	16-20	505
Total Non-Professional Drivers	1,624	Over 20	1,202
		No experience given	64

a These subgroups tabulated as one group entitled Professional Drivers.
b These subgroups tabulated as one group entitled Non-Professional Drivers.

Survey Results

Public interest and cooperation were of prime importance because the survey was conducted to investigate the possibility of applying public opinion survey methods to certain phases of traffic engineering. Except for a few cases in the trial samplings, it became apparent that the motor vehicle operators welcomed a chance to express an opinion on certain phases of highway traffic. Each respondent was asked to comment on the questionnaire technique employed in obtaining this information. The results for this and certain other survey questions may be found in the following paragraphs. The italicized questions are as they appeared in the questionnaire.

What do you think of this method of obtaining public opinion in regard to traffic conditions? Have you any suggestions to assist us in obtaining this information?

The actual survey confirmed the preliminary observation that the motor vehicle operators appreciated having the opportunity to express their opinions on certain highway traffic problems. A record was kept of the type and number of comments written on the questionnaires. For ease in tabulating, the comments were divided into four main classes:

1. One or two word comments of a favorable nature.
2. Favorable comments of more than two words. Many of these were of several sentences in length.
3. Unfavorable comments.
4. Comments of such nature that they were neither favorable nor unfavorable but made suggestions as to possible ways of improving the questionnaire or other means of obtaining the desired information.

Forty-seven per cent of the 3,683 respondents made comments that were favorable to the survey method while only one per cent were of an unfavorable nature. One per cent of the respondents made comments having no marked preference, and the remaining 51 per cent failed to comment on the survey.

Nearly one half of the favorable comments were given in a few words such as O.K., Fine, Good idea, etc. The following statements are examples of more detailed favorable comments:

An Indiana truck driver wrote, "I think it is a very good way to get uniform laws to keep down confusion when traveling from state to state."

"O.K.," commented an Indiana housewife. She continued, "Method could have wider distribution through service clubs."

"Good—give questionnaire with application for renewal [of] driver's license," was the comment of a Michigan salesman.

"Excellent, but how about getting large motor fleets to question their drivers, and asking all people on receipt of their car license, to fill out [a] form," was the view expressed by an Indiana woman who drives for the Red Cross.

In Table 2, the per cent of each type of comment is shown for the several classifications—Indiana and Non-Indiana Drivers, Sex, Occupation Age, and Years of Driving Experience.

TABLE II
Distribution of Respondent Comments

	Respondents	Favorable		Unfavorable	Other or None
		One Word	More Elaborate		
TOTAL	3,683	23%	24%	1%	52%
STATE					
Indiana	3,133	23	22	1	54
Non-Indiana	550	22	32	1	45
SEX					
Men	2,967	24	24	1	51
Women	716	19	22	1	58
OCCUPATION					
Salesman	426	24	31	*	45
Truckdriver	441	24	25	0	51
Professional Persons	456	27	25	1	47
Other	736	22	24	1	53
Total Professional Drivers	2,059	24	26	1	49
Farmer	432	26	14	1	59
Businessman	107	18	32	3	47
Businesswoman	39	23	28	0	49
Worker who drives to work	276	19	19	2	60
Housewife	333	18	19	*	63
Pleasure Driver	425	22	28	1	49
Other	12	42	25	8	25
Total Non-Professional Drivers	1,624	22	21	1	56
AGE					
15-19	196	23	31	3	43
20-24	537	21	26	3	50
25-29	718	21	26	4	52
30-34	576	20	25	2	53
35-39	422	27	23	1	49
40-44	437	27	20	*	53
45-49	293	23	20	0	57
50-54	194	27	22	1	50
55-59	127	26	18	1	55
Over 60	97	17	20	1	62
No age given	86	15	16	1	68
YEARS DRIVING					
1 or less	102	20	26	5	49
2-3	164	25	29	2	44
4-5	223	24	23	2	51
6-7	271	22	23	1	54
8-10	484	18	26	1	55
11-15	668	22	28	*	50
16-20	505	22	24	1	53
Over 20	1,202	26	20	1	53
No experience given	64	24	9	0	67

* Less than one-half per cent.

Solid vs. Dashed Centerline

Which type of centerline do you prefer on a concrete (or blacktop) surface? Solid, dashed, or dotted?

The survey results for this question and the following questions are worthy of attention because of the possible effect of the survey technique on the results and from a technical standpoint of driver opinion versus actual practice.

As of June, 1950, all but 8 of the 48 states used the dashed type of centerline marking as recommended by *The 1948 Manual on Uniform Traffic Control Devices* (18, 19). Indiana was one of the states which used a solid centerline marking and thus did not conform to the recommended practice but since that time dashed centerlines are being utilized in the state.

The survey results indicated that 87 per cent of the Indiana and 80 per cent of the non-Indiana respondents favored a solid centerline marking on concrete surfaces while 76 per cent of the Indiana and 66 per cent of the non-Indiana respondents favored a solid centerline marking on blacktop surfaces.

Proponents of the dashed line point out that approximately 60 per cent less paint is required for the dashed type of marking, as recommended in the manual (19, p. 18). It would be interesting to investigate the possible effect the knowledge of such a saving would have on the respondents' choice of solid or dashed types of centerline delineation.

Centerline Color

What color of centerline do you prefer on a concrete (or a blacktop) surface? Yellow, white, or black?

Although the Uniform Manual recommends a white centerline for all states (*ibid.*, p. 77), the survey results show that 45 per cent of the respondents prefer a black centerline on a concrete surface, 41 per cent prefer yellow, and only 12 per cent desire the recommended white color. The present Indiana practice of using a black centerline on a concrete surface was favored by 45 per cent of the Indiana replies and 44 per cent of the non-Indiana drivers.

Sixty-two per cent of all the respondents preferred the recommended white color for a blacktop surface while 34 per cent selected yellow and one per cent favored black.

What color centerline do you consider most visible in bad weather on a concrete (or blacktop) surface? Yellow, white, or black?

Highway markings are designed and placed to aid and protect the highway user. Thus, visibility in all weather conditions is an important criterion for the selection of a color for roadway pavement markings.

Yellow was considered the most visible color for a concrete surface in bad weather by 48 per cent of the respondents. For the same conditions, 35 per cent thought black was the most visible, 15 per cent selected white, and two per cent gave no comment.

For a blacktop surface under bad weather conditions, 54 per cent of the respondents suggested white as the most visible color and 40 per cent suggested yellow.

Do you believe that a no-passing line should be the same color as the centerline? Yes or no?

Eighty-one per cent of the respondents thought that the no-passing line should be a different color than the centerline. This color differentiation is recommended by the 1948 Manual on Uniform Traffic Control Devices (*ibid.*, p. 82).

If you answered NO to the above question (color of centerline vs. color of no-passing line), what color do you suggest for the no-passing line? Black, yellow, white, or red?

Out of every 100 respondents who thought there should be a color distinction between the no-passing line and the centerline, 67 preferred a yellow colored no-passing line, 25 preferred red, seven chose white, and one thought black the best color. These groups constitute 54 per cent, 20 per cent, six per cent, and one per cent, respectively, of the total sample. A yellow color is recommended by the Uniform Manual, although white is given as a "permissible alternative" (*ibid.*).

Maximum Speed Limit

Do you believe there should be a maximum legal speed limit in Indiana (or in your state)? Yes or no?

Early in 1950 the Indiana State Police asked all the other states of the nation what speed regulations they then had in effect. The replies received from the various states revealed that, as of May 1, 1950, Indiana was one of 12 states without a maximum speed law for passenger cars on rural highways. The remaining 36 states have some type of maximum speed law (20).

The Indiana State Police have recommended that the 1951 General Assembly enact a state speed limit of 60 miles per hour for daytime and a maximum of 50 miles per hour at night. Samuel C. Hadden, Chairman of the Indiana State Highway Commission, endorsed the recommendation and said that if the proposed speed limits were rigidly enforced, traffic deaths would be reduced (21, 22, 23, and 24).

Sixty-eight per cent of all the respondents favored the establishment of a maximum speed limit. A similar number of Indiana drivers and 67 per cent of the non-Indiana replies also answered in the affirmative.

It should be noted that for the special out-of-state distributions (40 per cent of the total non-Indiana respondents) the phrase "your state" was substituted for the word "Indiana" in the question. No separate analysis was made on the basis of question phrasing. The phrase "your state" is used in the revised questionnaire.

If you believe there should be a speed limit, what do you suggest as a maximum legal speed limit for passenger cars in daylight? 45, 50, 55, 60, 65, 70, 75, or 80 MPH?

A speed limit of 60 miles per hour was suggested by 47 per cent of the respondents who indicated a maximum speed for passenger cars in daylight. (These drivers constituted 28 per cent of the total sample.) Only 17 per cent of the drivers favoring speed controls (11 per cent of the total sample) preferred a limit of 65 miles per hour, while a maximum of 50 miles per hour was selected by 15 per cent of these respondents (10 per cent of the total). This limit is higher than the limit most favored in two other recent surveys.

In a survey conducted in 1945, on a nationwide basis, 3,659 respondents were asked the question, "If you were asked to set one top speed for driving on a good open highway in this state what would it be? The following results were obtained:

"A third of the people (33 per cent) would set speed limit no higher than *45 miles an hour.*

"A total of two-thirds would set the maximum at *50 miles an hour* or under.

"Only 6 per cent of the people favor a speed limit about 60 miles an hour."

A median average speed of 48 MPH was suggested by the respondents (3).

Another nationwide survey was conducted early in 1950. "What do you, yourself, think the maximum (top) speed should be for automobiles on an open-country highway?" was the question asked. The results obtained indicated that:

> The median average figure named was 50 miles per hour. Car owners as a group tended to favor a somewhat higher speed. About four out of ten owners suggested limits in excess of 50 miles per hour (4).

Here is the table:

	Total	Car Owners
Less than 35 m.p.h	3%	2%
35-49 m.p.h.	24	20
50 m.p.h.	35	36
51-65 m.p.h.	28	33
Over 65	6	6
Don't know	4	3
	100%	100%

If you believe there should be a speed limit, what do you suggest as a maximum legal speed limit for passenger cars at night? 45, 50, 55, 60, 65, 70, 75, or 80 MPH?

The Indiana State Police recommendations appear to be further substantiated by this survey. A speed limit of 50 miles per hour for passenger cars was suggested by 41 per cent of those indicating a maximum speed for night driving (27 per cent of all respondents).

If you believe there should be a speed limit, what do you suggest as a maximum legal speed limit for trucks in daylight? 45, 50, 55, 60, 65, 70, 75, or 80 MPH?

When asked to suggest a suitable daylight speed limit for trucks, 51 per cent of the truck drivers favoring a speed limit selected a maximum of 50 miles per hour (42 per cent of all the truck drivers interviewed). It is interesting to note that present Indiana law limits trucks of over 5,000 pounds weight to speeds of 45 miles per hour.

The percentage (46 per cent) of all the respondents who designated 50 miles per hour for trucks in daylight was slightly lower than that of the truck drivers. This group, however, constitutes a much smaller part of the total sample (28 per cent). See Figure 2.

If you believe there should be a speed limit, what do you suggest as a maximum legal speed limit for trucks at night? 45, 50, 55, 60, 65, 70, 75, or 80 MPH?

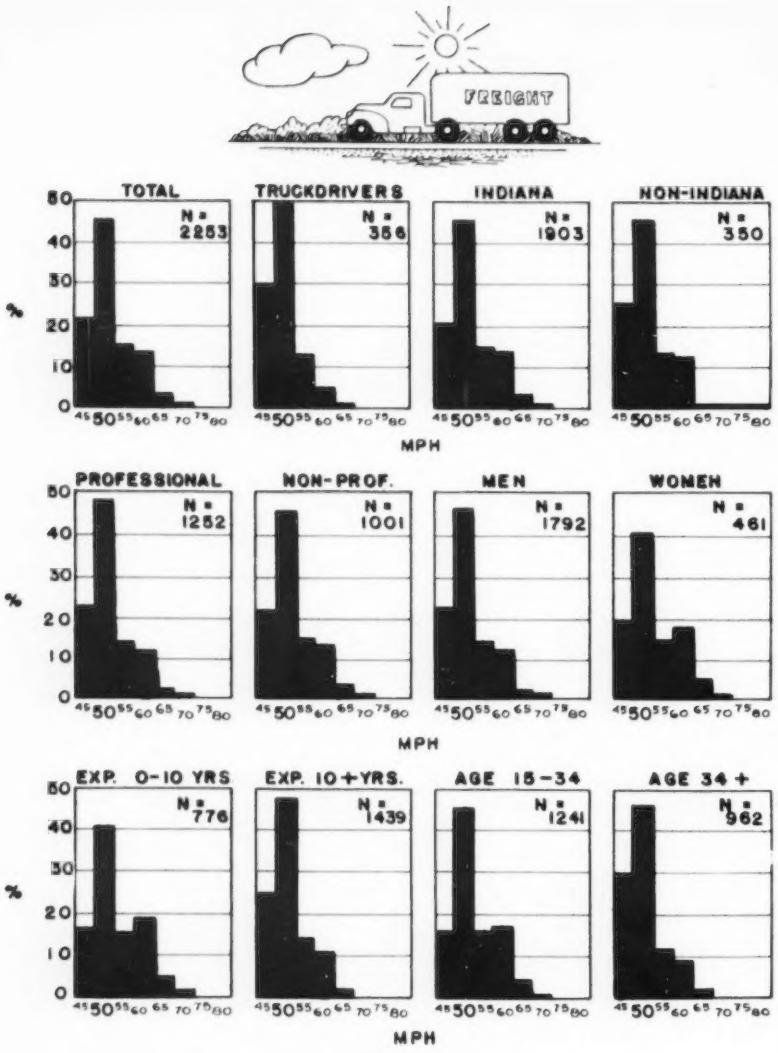

Fig. 2
Suggested maximum speed limit for trucks in daylight.

A 45 miles per hour maximum speed limit for trucks at night was favored by 71 out of every 100 truck drivers who suggested a limit (57 per cent of all truck drivers surveyed). This may be compared with the fact that 60 out of every 100 people in the total sample (35 per cent of the total respondents) who designated a definite limit also selected 45 miles per hour as a maximum. Present Indiana law specifies a 45 miles per hour speed limit for trucks weighing over 5,000 pounds at all times.

In the revised questionnaire form, the lowest possible answer to this and the other maximum speed questions is 35 miles per hour.

If you believe there should be a speed limit, what do you suggest as a maximum legal speed limit for buses in daylight? 45, 50, 55, 60, 65, 70, 75, or 80 MPH?

The survey shows that 38 per cent of the respondents who selected a speed limit for buses in daylight suggested a maximum of 50 miles per hour (22 per cent of the total sample); 25 per cent selected 60 miles per hour (15 per cent of the total). Present Indiana law specifies a speed limit of 50 miles per hour for buses at all times.

If you believe there should be a speed limit, what do you suggest as a maximum legal speed limit for buses at night? 45, 50, 55, 60, 65, 70, 75, or 80 MPH?

The respondents in favor of a speed limit for buses at night were almost equally divided in their choice of a maximum speed. A limit of 45 miles per hour was suggested by 41 per cent of these respondents. A similar number (41 per cent) selected a maximum of 50 miles per hour. These groups each constituted 24 per cent of the total sample.

Where hazardous conditions exist, do you believe that a maximum safe speed limit should be posted? Yes or no?

Approximately all (98 per cent) of the people interviewed believed that a "maximum safe speed limit should be posted" where "hazardous conditions exist."

Do you believe that traffic laws should be made reasonably uniform throughout the U. S.? Yes or no?

When asked the above question, 97 out of every 100 drivers interviewed answered "yes", two said "no", and one made no comment.

Summary

The survey results indicate that public opinion sampling methods may be applied as an aid in solving certain problems in traffic engineering such as roadway pavement markings, and that the respondents welcomed a chance to express opinions on specific highway practices.

Preference was given to a solid rather than a dashed centerline. Furthermore, the color of the centerline varied with the type of pavement. A black centerline on a concrete surface and a white centerline on a blacktop surface were recommended by the greatest number of the 3,683 respondents.

Yellow on a concrete surface and white on a blacktop surface were considered the most visible colors for the respective surface types in bad weather conditions.

Over half of the respondents who favored a color difference between the no-passing line and the centerline thought yellow was the best color for the no-passing line.

The largest number of respondents who favored establishing maximum speed limits in Indiana or in their home state recommended the following:

	MPH in Daylight	MPH at Night
Passenger Cars	60	50
Trucks	50	50
Buses	50	50 or 45

The majority of the respondents thought that a "maximum safe speed limit should be "posted" where "hazardous conditions exist."

Conclusions

The following conclusions may be drawn on the basis of the information obtained in this study:

1. Public opinion sampling procedures appear to be applicable to certain phases of traffic engineering. It should be understood that the survey returns are not recommended as a panacea but, when applicable, may supplement technical information and serve as a guide and tool for the traffic engineer.
2. The motor vehicle operator is willing to give time to express opinions on certain highway traffic practices. This is evidenced by the ready cooperation obtained wherever the survey forms were distributed to the respondents, the oral and written comments of the respondents, and the very small number of respondents who failed to answer the questions seriously.
3. The survey results indicate that further investigations may be warranted for such questions as:
   a. Is the information in this type of survey of such quality as to be acceptable as an aid in establishing uniform roadway pavement markings?
   b. Is the "closed type" question, used in this survey, the most effective for obtaining roadway marking information, or is some other survey sampling technique more reliable and economical?
   c. Is the American driver aware of his definite likes and dislikes as related to roadway pavement markings?
   d. Are the findings of this survey representative of local, regional, or national thought concerning pavement markings?

It is generally conceded that the average driver not only considers himself as a highway expert, he is also a traffic expert and a very well qualified one at that. Thus it is very important that all classes of drivers be given an opportunity to answer any survey questions for their answers are naturally influenced by their particular activities. How each class of driver can be adequately sampled is a problem that must be solved before the traffic engineer can begin to apply opinion polling techniques as one of his tools.

Another problem that must be considered is that of the "non-returns." For example, suppose the driving public is sampled by means of mailing a questionnaire to every *nth* applicant for a driver's license renewal. If 68 per cent of the truck drivers return their completed questionnaires while only 32 per cent of the traveling salesman and 14 per cent of the pleasure drivers reply, what assumptions can be made concerning those truck drivers, traveling salesmen, and pleasure drivers who did not reply? One assumption would be to assume that the non-replies would be in the same proportions as the replies received and thus the non-replies could be ignored and the replies could be considered to be representative of the feelings of the truck drivers, traveling salesmen, and pleasure drivers.

Another approach could be to attempt to requestion the non-replies until answers are received. This method naturally becomes increasingly costly the greater the number of non-replies and the more times the questions must be repeated.

While questions in this study were designed to test the method rather than to obtain specific information, any future surveys might contain questions which cover subjects the driver is qualified to answer. Very few drivers are aware of how long it takes them to stop their vehicles under varied human, vehicle, and road conditions, thus the general public may not be considered qualified to answer questions dealing with sight distance or how far warning signs should be placed in front of any obstacle.

Many authorities in the fields of highway and traffic engineering have very kindly commented on this study in the past two years. Many of these gentlemen agreed that there might at least be limited applications of public opinion surveying techniques to traffic engineering. However a few appeared to be of the opinion that the public doesn't know what they want nor what is good for them so why bother with them.

It is granted the majority of the replies to a specific traffic question may be diametrically opposite to sound engineering principles. For example, 82 per cent of the respondents in a local survey may reply that a speed limit of 25 miles per hour is too low for a given section of road in the area. Two main possibilities are then open to the traffic engineer. First, he can just ignore the question replies and second, he can review his basis for setting the 25 mile per hour speed limit. After reviewing his conclusions he may find that either he or the public is wrong. If his earlier conclusions are in error, he can act to change the limit. But, if the public is wrong, then he has a definite mandate to utilize one and possibly two of the 3 E's of traffic engineering. He should begin at once to educate the public as to why speeds above 25 miles per hour are unsafe for existing conditions and if necessary utilize enforcement agencies to augment the educational program. In either event, the views of the public have enabled that traffic engineer to better perform his duties. To him a public opinion poll that correctly presents the public's opinion would not only be a valuable tool but perhaps a necessary tool.

Acknowledgments

The author wishes to express his appreciation to the following faculty members of Purdue University: K. B. Woods, Associate Director of the Joint Highway Research Project, for his counsel and encouragement; A. K. Branham, Reseach Associate, who guided the most important stages of the investigation; the late K. S. Davenport, Assistant Professor of Psychology, for his helpful consultations; S. E. Wirt, Supervisor of Tabulating Division, who facilitated the tabulation of the data; and F. H. Green, Associate Professor of Highway Engineering, for his advice in the initial phases of the study. The author is also indebted to members of the Highway Research Board Committee on Roadway Pavement Markings and to N. F. Schafer, Director of Traffic, and W. F. Milner, Traffic Engineer, of the Indiana State Highway Commission, for their helpful suggestions. The kind assistance of the several cooperating agencies and their representatives, and the patience and understanding of the men and women on the Joint Highway Research Project staff in the preparation and coding of the survey questionnaires and data are greatly appreciated.

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(Continued on page 138)

24th Annual ITE Meeting Paper

No. 7, Presented at the Third Technical Session, which was devoted to the subject, Operation, Wednesday afternoon, September 30, 1953.

The Pennsylvania Turnpike Joint Safety Research Project

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THE MATERIAL PREPARED for this discussion will acquaint you with the objectives, the organization, the program, and the plan of attack established for the Pennsylvania Turnpike Joint Safety Research Project. This background will serve well to provide a sound understanding of the final report when it is issued.

The objectives of this research project are clearly defined and two fold in nature. The first objective is to analyze and evaluate the fundamental causes of accidents on the express highway. The second is to critically analyze and evaluate means or methods that are already available or that can be made available for counteracting the causes of accidents once these causes have been clearly recognized and evaluated.

These objectives called for personnel adaptable to carrying out the assignments in a straight forward manner, and led to the organization of a group of member organizations who were prepared to furnish the personnel. The need for men acquainted with Turnpike administration practices, past history and overall general aid is being met by the Pennsylvania Turnpike Commission and their consulting engineer firm the J. E. Greiner Co.

The requisite for comprehensive psycological study is being filled by the American Institute for Research of Pittsburgh, Pa.; an organization with a wealth of experience in this type of work.

The responsibility for carrying out the research program including its general administration, the field team for "vehicle miles driven" exposure studies and other field checks, the general analysis work, and the engineering talent is being provided by the Union Switch & Signal Division of the Westinghouse Air Brake Company.

This project group having been established and cognizance taken of the material at hand, the program for conducting the research was laid out in the following 5 phases.

1. The first phase covers a study of the police accident reports accumulated over 12 years of Turnpike operation.

   This same phase also covers the preparation of a bibliography and a psychological background study with a point in view of avoiding repetition of work already done by other men in this same field.

2. The second phase is for field studies indicated as being necessary after phase 1. The first phase was barely started when the needed field studies became apparent. The net result being that both phases are being carried out simultaneously.

   These two phases will give the analysis and evaluation of fundamental causes of accidents as called for in the first objective.

3. The third phase is set up for a thorough analysis of remedial measures with the point in view of deciding which have promise. This work will start after we see results from the first two phases.

4. The fourth phase is the field trial phase where the means or methods appearing to have good potentialities as means for reducing accidents will actually be tested in the field. These methods of course will come from phase 3.

   The second objective will be fulfilled through phases 3 and 4.

5. The last and fifth phase has been included for the preparation and presentation of a final report.

The plan of attack for determining, analyzing and evaluating the fundamental causes of accidents will perhaps be the most interesting part of the material being presented for you today. Considerable deliberation was given to this plan of attack and the one chosen is based on the study of the fundamental components appearing in the express highway traffic picture.

The components of traffic as set up in our plan of attack come from an academic description of express highway traffic. The description bears consideration here in as much as it clearly indicates the components being studied and their origin in the study. We see a driver with a powered vehicle having a comparatively simple set of control gear faced with the task of operating his vehicle, along with other drivers and their vehicles, over a varying road-course under different degrees of visibility and road surface conditions: the visibility and road surface conditions being determined by the general environmental factors of the season of the year, the time of the day, and the weather. In addition we see administration (setting up practices such as cindering of icy highway), legislation (providing rules of safe conduct), publicity (or newsprint enlarging on the drivers awareness) and and education (tending to increase the drivers capabilities) as being part of this traffic picture. Taking this description apart and adding the last four items mentioned we have the following main factors with which to deal:—

1. The Driver
2. The Vehicle
3. Road-course
4. Other Traffic
5. Visibility
6. Road Surface Conditions
7. Weather
8. Administration
9. Legislation
10. Publicity
11. Education

In addition to the basic factors just mentioned, side studies will be con-

ducted on a number of other points either as separate side studies or as items to be studied in conjunction with main factors. One classification of a group of these detail points might be termed "general vehicle mile exposure check and general summary information." This includes a survey of accidents according to the hour of the day, a.m. or p.m., and the day of the week. Another set of points might be called "orientation" whereby the accidents are viewed from the standpoint of the "place of occurrence" such as main line, tunnel area, minor and major bridges, gas station area, etc. This latter study is made to insure there are no specific points that need special treatment. A study of accidents by milepost location also falls under this category. There are a number of additional accident details being summarized to tie in with the psychological research; namely, accidents according to the state of registration, age of driver, sex of driver, estimated initial speed, unsafe personal factor such as driving while ill, the number of trips over the Turnpike, and unsafe action such as illegal parking. Added to this will be a correlation between the accidents and the fatalities, the injuries and the property damage. Also included with the main causal study will be the detail of how vehicles were involved in the accidents; namely, whether they were rear end collisions, sideswiping accidents, etc.

Coming back to the main components, these, as mentioned, were taken from the description of express highway traffic and are the basis for the plan of attack. It was necessary to take a view of these components from the accident standpoint; a view which would serve as a guide in following our attack. The view or premise being utilized in this study is as follows:— The varying external components, (one of which for example is visibility), call for greater or less driver quality depending on the severity of the component. Another way of stating this is that the inherent characteristics of the driver are always being matched against an external sphere of influences represented by the external components.

Following this premise, the driver component is being studied as one main factor and the other or external components except for administration, legislation, publicity and education are grouped for study as an opposing factor. The exceptional group will be given a special study.

The study of the driver is being approached from the standpoint of the driver behaviors which are most critical as causal factors in accidents. The techniques of analysis being used in this research are those which have proven themselves in the determination of military air craft accident causation. These same techniques have proved to be a stable basis on which to establish pilot selection tests for several major air lines. As mentioned previously comparative background study has been made to utilize facts that may have been discovered concerning driver behavior in previous studies of this nature. So far this review of background research has been somewhat disappointing when the comprehensive nature of the program outlined is taken into consideration.

Two sources of information are being used to establish driver behaviors just prior to the accident. The first source consists of the large number of Pennsylvania State Police accident reports covering those accidents which have occurred on the Pennsylvania Turnpike. Enough of these accidents are reviewed to insure that the behavior pattern has been covered from that source.

The second source is information gathered from interviews with drivers on the Turnpike itself. These interviews are based on the technique of "near accident" analysis. This consists of obtaining statements regarding near accidents or "close shaves" which drivers have seen or in which they have been involved while driving on the Turnpike. The facts so gathered are an essential supplement to the accident records for several reasons. First, some accidents are fatal and therefore data regarding behaviorism is lost. By driver interview we have some check on the possibility of picking up behaviorisms that otherwise might have been lost through fatalities. Secondly, statements by drivers in accidents may be biased by fear of legal action or by the unfavorable circumstances surrounding the accident. These deterrents to an accurate report are not present in the case of the near accident interview. In effect the interviews provide objective statements of specific driver behaviors resulting in hazardous situations. This method represents a very practicable approach to the accumulation of facts about accident causation.

The interview information when analyzed and dovetailed with the accident record data will result in a comprehensive list of driver behaviors related to accident causation.

The classification of these behaviors will provide the causal factor from the standpoint of the driver at least at the first level of reasoning. It may be necessary to study some of these behaviors beyond the first level of reasoning and apply tests under controlled conditions to reach a more basic reason for the behavior.

The external components or environmental factors on the other hand are first broken down into classifications. For example, the classifications for road surface conditions could be dry, wet, snow and slush covered, ice covered. These classifications are being approached by analyzing their frequency of appearance in accidents, and are being considered in two ways. First, the classifications for only one component at a time are being analyzed and studied. This procedure serves two main purposes. It allows each of the factors to be viewed individually free of complications set up when other factors are involved in the same study. Secondly, and another point in favor of the study of the components individually is that the large amount of data covering one factor serves to wash out very well possible errors in compilation and processing. Another reason is the fact that the individual study will serve as a check against the second method which I am about to describe.

The second consideration of the external components is the analysis of their classifications in combination. For example, the accidents by light conditions are split according to the three categories daylight, dusk and dawn, and darkness. These three sets of data are each divided according to three weather classifications, for example "clear and cloudy," "foggy," and "snow, rain, sleet." This division so far has given us a total of nine sets of accident data from the standpoint of combinations. Each of these nine sets will be split according to road surface conditions classified as dry, wet, snow or slush covered, ice covered. These combinations are continued until the classifications for each of the factors have been set up in combination. The frequency of appearance of these combinations in accidents are analyzed and studied. The combination study takes into account the fact that one factor may have an appreciable effect upon some other factor. This study along with the analysis of the components on an individual basis gives a

cross check and at the same time shows whether influences between the components actually exist.

Dealing more specifically with the first of the two methods or the individual external component treatment, the frequency of accidents are plotted against the various classifications for a given component using all of the accident data available. This results in a graph we have termed the "master pattern." Similar patterns using data limited to one year at a time are set up to show any major break by year from the master pattern. At the same time other patterns are established using the data that applies to one specific point such as the road-course. For example, the accidents occurring on straight roadway and those occurring on curves are plotted against the classification on one component in a manner similar to that for the master pattern. Here again comparison shows whether the effect of the various component classifications is greater on straight road or curved road and whether either digress from the master pattern.

In the case of the combination sorts, the accidents or vehicle involvements falling under the various combinations shows by predominant appearance which combination of circumstances carries the greatest responsibility in the accident picture. The more important of these will be broken out further as to yearly repetition, as to the type of accidents, etc.

All of these studies are being made according to the class of vehicle. The two broad classes being passenger cars and commercial vehicles.

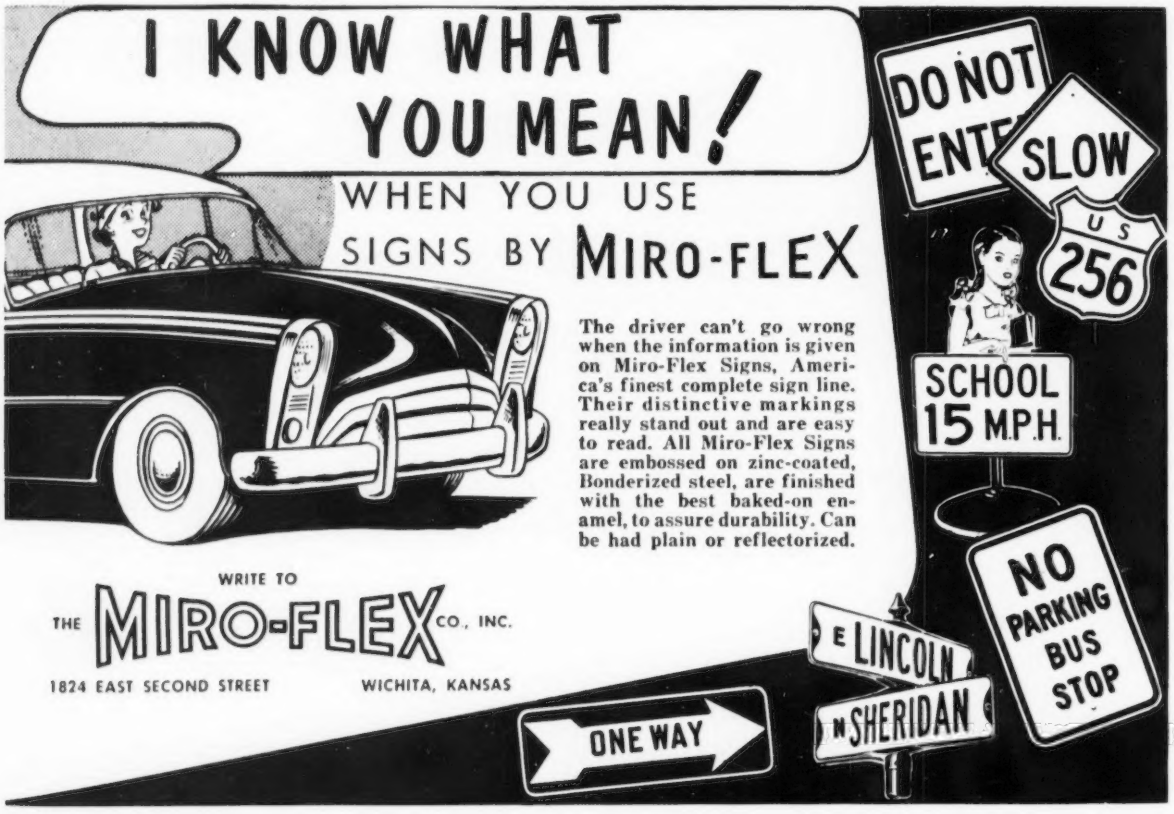
Upon completion of the driver study and external component study the results of the two will be correlated to satisfy the first objective.

While the components are being studied to show quantitatively their predominance or frequency of appearance in accidents, work is in progress to establish "vehicle miles driven" data for evaluating the actual driver exposure to the various external component classifications. The results of these exposure studies will be used to weigh the quantitative data thereby giving qualitatively the causal factors most critical in accidents.

The plan of attack for the second objective is to review thoroughly all suggestions for reducing accidents that have been accumulated in the Turnpike Commission's files. These will be judged first from the standpoint of the apparent ability of the suggestion to meet the requisites set up as a result of the causal study. Over and above this, those that appear to be adaptable will be considered from the standpoint of practicality including such things as ease of design and manufacture which in turn will have a bearing on the economic factor. Along with this, consideration will be given to such items as maintenance, and above all, the remedial measure must not have the potential of increasing the accident rate; something which can very well be hidden and difficult to detect. If none of the suggestions appear to have possibilities, then studies will follow towards the development of the remedial measures appearing to be needed.

Following the study of the remedial measures, those means or methods that appear to have merit will be set up for trial in the field and their effect closely observed. This work will result in the reaching of our second objective.

Of course the final report will follow the field trials and at that time we expect to have a report that will not only be of interest to you gentlemen but that will be of great benefit to you and our traveling public as well.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SIGNS BY MIRO-FLEX
The driver can't go wrong when the information is given on Miro-Flex Signs, America's finest complete sign line. Their distinctive markings really stand out and are easy to read. All Miro-Flex Signs are embossed on zinc-coated, Bonderized steel, are finished with the best baked-on enamel, to assure durability. Can be had plain or reflectorized.
WRITE TO
THE MIRO-FLEX CO., INC.
1824 EAST SECOND STREET WICHITA, KANSAS
DO NOT ENTE
SLOW
US 256
SCHOOL 15 M.P.H.
NO PARKING BUS STOP
E LINCOLN
N SHERIDAN
ONE WAY

Production Up Cost Down, for This Sign Shop

By A. M. White (Mem., ITE), Traffic Control and Safety Engineer
and
Jack W. Chambliss (Jun. Mem., ITE), Assistant
Mississippi State Highway Department, Jackson, Mississippi

Fig. 1
Operator applying base coat as conveyor system passes signs through spray booth.

THROUGH THE UTILIZATION of a reconditioned conveyor system plus home-made baking oven and spray booth, the Mississippi State Highway Department has stepped up its traffic sign production better than 400%—and for a minimum cost slightly over $2000.00! As is the case in many State and City Sign shops, an ever increasing demand for improved quality and quantity, coupled with limited budget necessitated a search for improved methods requiring a minimum of capital outlay.

Prior to the installation of the baking oven and conveyor system, sign finishing required long, tedious man-hours resulting in limited production, fair quality, and poor efficiency. Now, the sign is placed on the conveyor, sprayed with base or prime coat in the spray booth, and passed through the baking oven resulting in a dry prime coat in five minutes baking time. An enamel coat is then sprayed on and the same process repeated. The enamel coat requires eight minutes baking time. Thus both the prime and enamel coats can be baked in a total of thirteen minutes drying time. On the average, a finished sign comes out of the oven every minute, the rate of production being limited by the speed of the oven drying process. Actually the length of oven, quality of paint, and the bulb wattage all affect drying time. Once the baking process is completed, the sign is ready for silk screening or application of reflectorized sheeting. When beads are used to reflectorize, a binder coat is sprayed on and the beads are applied prior to the baking process so that they are later baked in with the binder material.

In the development of the spray booth, materials and equipment on hand were utilized to advantage. Already in use in the shop were an exhaust fan, spray gun with supply tank, and an air compressor, equipment commonly found in most shops. The booth itself was constructed from 2″ x 2″ x ⅛″ angles, 1¼″ x ⅛″ flats and 24 gauge sheet tin, most of which was obtained from the shop scrap pile. It was prefabricated in the highway shop using shop personnel only.

The constant recirculation of the water spray was achieved by the use of an old gasoline engine-driven pump, converted to electrical operation by the attachment of a three H.P. electric motor. A front view of the spray booth is shown in Figure 1. The booth is situated so that the spray gun operator can readily reach the conveyor if it becomes necessary for him to remove or attach signs. A switch is provided to stop, start, or change the speed of the conveyor.

The conveyor is of the overhead or suspended type and was secured from an old factory which was going out of business at the time. It was purchased for $300, the purchase included sufficient additional length to extend the system into an adjoining storage building at a later date. This would ultimately provide a system to convey the signs from the spray booth, through the oven, and on to their final storage area, thus eliminating unnecessary handling by shop personnel. Two speeds are provided on the drive so that either the five or eight minute baking period may be achieved as is desired.

The baking oven pictured in Figure 2, is 17′ long (16′ between the bulbs at each end) and consists of eight banks of 115 volt, 250 watt infrared bulbs wired in parallel and connected to a 220 volt source. Size #8 wire was used from the circuit breaker to the oven frame; #12 from the central box on the frame to the individual banks of lights. A total of 136 bulbs comprise the complete unit, producing an operating temperature of approximately 250 degrees F. Each circuit is complete with individual 50 amp. circuit breaker for greater protection and versatility. (Any number of banks of lights may be turned on in any combination, depending on sign size and heat required.) The main switch is controlled by 300 amp fuses. The infrared bulbs are spaced approximately 11″ horizontally and 8″ vertically.

The equipment shown in Figures 1 and 2 was constructed from material either purchased secondhand or salvaged at a total cost of $2100.00 to the Highway Department. It is estimated that the monthly power rate is $60.00 for the oven conveyor, spray booth and other additional miscellaneous equipment used in conjunction with the operation. It is of note that the additional demand for power, brought on by the use of the oven, warrants a lower rate with corresponding benefits to the entire shop. Only two men are required to operate the process—one spray gun operator and one man to load and unload the conveyor.

As previously mentioned, it is planned to further expand the existing facilities as time and finances permit. With the conveyor system extended to an adjoining building, all new and reconditioned signs will be transported to this area for storage. Steel supporting racks consisting primarily of 7″ I-beams are to be constructed along the walls so that floors will be left clear for additional future installation of equipment when the need becomes apparent.

It was not the intent of this article to declare the above outlined process as the ultimate in modern production techniques of sign manufacturing; no doubt, there are many commercial sign manufacturers whose production facilities far surpass those of this discussion. However, it is pertinent that states and cities CAN improve their sign production facilities without excessive expenditures. It is hoped that the details outlined above will be of some assistance to other traffic agencies in improving their sign shop methods.

If you desire to build a unit of this type, we will furnish any additional information and sketches.

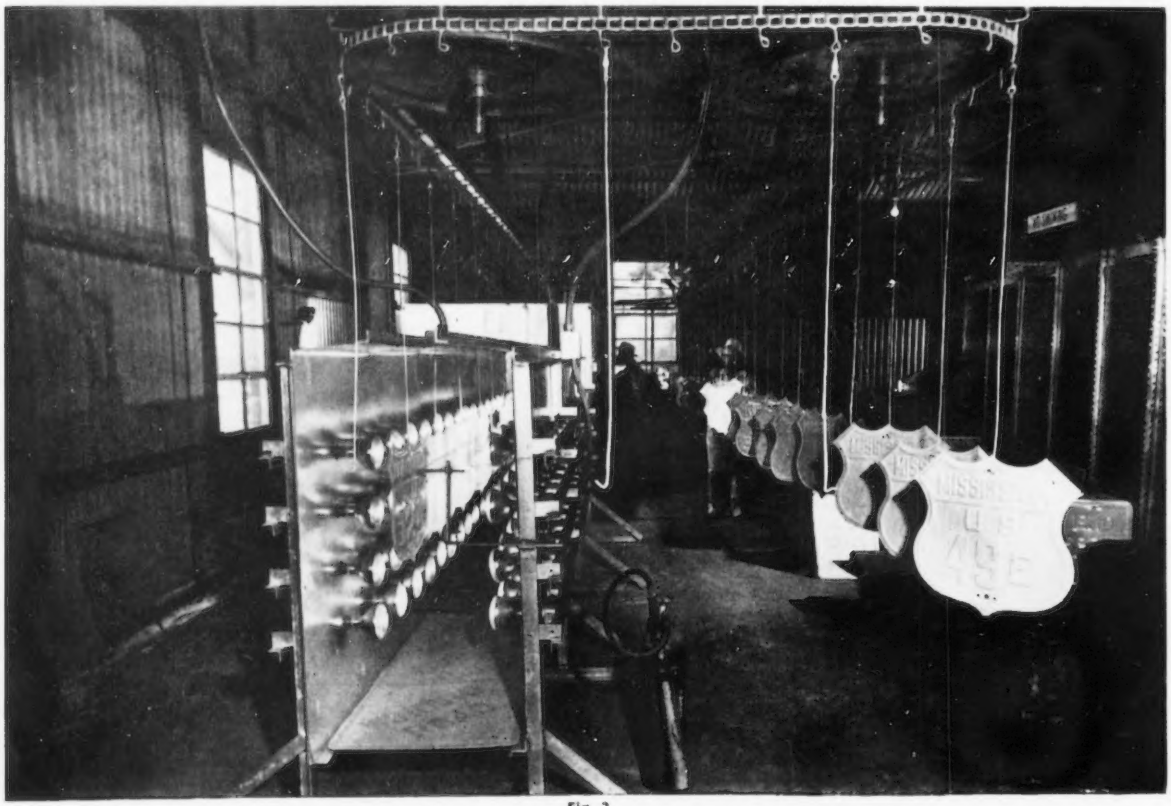


Fig. 2
End view of drying oven showing sign drying process and conveyor system.

Year-end Roundup of Toll Road Trends

By the Editorial Staff

Toll highway financing and construction will reach a new peak in 1954, with an increasing number of states figuring in such developments and feasibility studies of possible future projects, analysis of reports from state capitals indicates.

Among the latest current and prospective developments, on a state-by-state basis are the following:

ARKANSAS: A study of the possibility of contributing to a solution of the state's highway financing problems through toll roads is being conducted by the State Legislative Council. The study was ordered by the 1953 legislature after Governor Cherry vetoed a toll road enabling act.

CONNECTICUT: Plans have been announced by Governor Lodge for the sale early next year of $50,000,000 to $60,000,000 in bonds as part of the financing of the 125-mile toll highway to be constructed across eastern Connecticut, from the New York line near Greenwich to the Rhode Island line at Killingly. The entire project is expected to cost more than $200,000,000. The bonds will be secured by gasoline taxes as well as toll receipts.

FLORIDA: A delay of two or three months in Florida toll road plans was expected to result from Acting Governor Johns' appointment of a new State Turnpike Authority membership. The acting governor has asserted, however, that he wants to proceed with construction of a "bob-tailed" toll highway extending some 103 miles northward from the Miami area. Engineers have estimated such a road could be feasibly constructed with a $62,000,000 bond issue.

GEORGIA: A bill to authorize a cross-state, $225,000,000 toll super-highway was pending at this writing in the Georgia legislature, with the backing of Governor Talmadge. The measure would create a new Georgia Bridge and Turnpike Authority, which could finance and construct the much-discussed Georgia section of a projected north-south toll superhighway, as well as other toll road and bridge projects.

A provision of the Georgia bill stipulated, however, that the proposed authority could join with representatives of other states in building the contemplated state-long, four-lane toll road only "upon a formal proclamation by the governor that such a project is feasible and is necessary to avert the loss of tourist traffic" through the state.

The Georgia bill set no actual route for the road, which would run some 300 miles, roughly from Cartersville to a point below Valdosta. Some 80 miles of four-lane road already is authorized under construction or already completed between Cartersville and Griffin.

ILLINOIS: Chairman Evan Howell of the Illinois Toll Roads Commission has revealed plans for completion within two years of a toll road in the Chicago area to tie in with a projected Indiana link in a toll road system to the Eastern seaboard. He also announced that a court test would be made of the constitutionality of the state's new toll road enabling act.

INDIANA: State Toll Road Commission announced a $280,000,000 revenue bond issue to finance construction of the projected toll superhighway across northern Indiana had been marketed. Linking with the toll superhighway now being constructed across northern Ohio, the Indiana turnpike will run 150 miles to the Indiana-Illinois line near Hammond.

KANSAS: A preliminary report on the feasibility of a Kansas City-Topeka-Wichita toll highway is expected to be ready by mid-January, the Kansas Turnpike Commission was informed by its consulting engineers, Coverdale & Colpitts of New York and Howard, Needles, Tammen & Bergendoff of Kansas City.

KENTUCKY: Plans for the financing and construction of a $30,000,000 toll highway between Louisville and Elizabethtown are being deferred pending the outcome of litigation to test the validity of the 1950 state toll road enabling act. Hopes for quick action in the test suit, which started as a "friendly" action in the Franklin County Circuit Court, were blocked when the Louisville Automobile Club intervened in opposition to the act. Motel and gas station operators subsequently joined in opposition. Constitutionality of the act was upheld by the Circuit Court in an opinion appealed to the State Court of Appeals.

MAINE: Construction work is under way on the $55,000,000 extension of the Maine Turnpike from Portland to Augusta, with a 1955 completion target date. Plans are to open the Portland-to-Lewiston link sometime next year.

MASSACHUSETTS: Bonds to finance construction of the projected $200,000,000 cross-state Massachusetts toll highway are expected to be offered early in 1954. Meanwhile, a bill has been filed for consideration by the 1954 state legislature under which state gasoline taxes collected on the projected east-west turnpike would be turned over to the State Turnpike Authority for maintenance and operation of the road.

MICHIGAN: After receiving a preliminary report from the engineering firm of Edwards, Kelcey & Beck indicating the feasibility of a proposed 176-mile toll road running west from Detroit toward Chicago, the Michigan Turnpike Authority named an underwriting group headed by Blyth & Co. and First of Michigan Corporation to prepare a revenue bond issue of some $215,000,000 for the project.

Linking with the Willow Run expressway near Ypsilanti, the proposed Michigan toll highway would run north of Jackson, Albion and Marshall, south of Battle Creek and Kalamazoo, west to Benton Harbor and south to New Buffalo, south of which it would connect with the projected Indiana turnpike.

Meanwhile, feasibility surveys of a proposed $100,000,000 turnpike running 102 miles from Detroit to Bay City are being made for the Michigan authority by the engineering firms of Coverdale & Colpitts, New York, and J. E. Greiner Co., Baltimore.

NEW JERSEY: Recent marketing of $135,000,000 New Jersey Highway Authority state-guaranteed bonds completed financing for the $285,000,000 Garden State Parkway, construction of which is scheduled for completion in 1954. A $150,000,000 bond issue had been floated by the authority in July.

The New Jersey Turnpike Authority, a separate agency, took immediate preliminary steps to pave the way for construction of a Newark Bay-Hudson County extension of the New Jersey Turnpike after selling a $150,000,000

bond issue to finance that project and other purposes. The new extension will run from the Newark Airport interchange to the Holland Tunnel plaza in Jersey City.

NEW YORK: Although it is still too early to estimate the final cost of the new toll superhighway being constructed from New York City to Buffalo, the State Thruway Authority announced in November it had already spent or obligated on the project approximately $506,000,000 or $6,000,000 more than the original authorization.

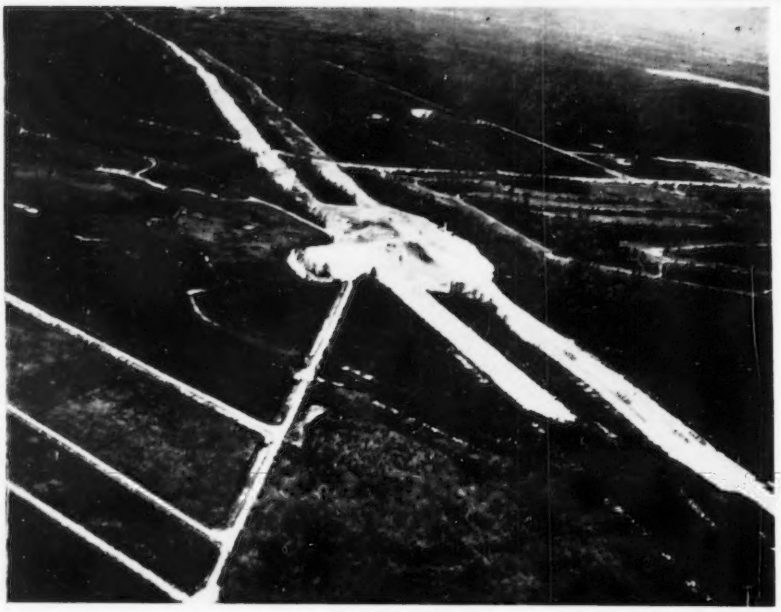
At the same time it was disclosed that about 17 miles of the road remained to be placed under contract. Also to require additional money are gasoline stations, restaurants and rights of way. Completion of the 427-mile route is scheduled by 1955.

The thruway authority also is committed by law to construct four feeder routes totaling 108 miles as well as a five-mile link from the thruway at Nyack to the northern terminus of the New Jersey Turnpike. While no official estimates of the cost of the extensions have been announced, it previously was unofficially estimated that such connections with the main route would cost at least $150,000,000 and possibly more.

Under authority of a new law enacted in 1953, the Jones Beach State Parkway is expected to market a $40,000,000 bond issue before April to finance acquisition of land and improvement of the Southern State Parkway in Nassau County, extension of the Meadowbrook State Parkway, widening of the Wantagh and Meadowbrook Causeways, and improvement of parking fields at the Jones Beach State Park. The bonds will be secured by revenues from a 10-cent toll to be imposed on the Southern State Parkway.

OHIO: State Turnpike Commission hopes to open 22 miles of the eastern end of the Northern Ohio Turnpike by Nov. 30, 1954, nearly a year before the rest of the 241-mile project is completed. The 22-mile stretch will connect Ohio 18 with the Pennsylvania Turnpike.

Meanwhile, State Highway Department funds are being sought to finance a survey of a proposed 300 mile toll road between Cincinnati and Conneaut. The proposed second Ohio toll superhighway, which has been recommended by the State Turnpike Commission and is favored by Governor Lausche, would run diagonally from the southwest to the northeast corner of the state.



Great pathways of white sand indicate where the State Parkway will traverse New Jersey's pine belt. The large cleared area in the center of the picture shows where a hill has been leveled to provide a smooth course for the scenic route.

OKLAHOMA: Litigation pending at this writing will determine whether Governor Murray can carry out his plans for a special election in late January for a referendum vote on two 1953 Oklahoma laws authorizing construction of three more toll superhighways in the state.

Court action stemmed from delaying tactics of the Oklahoma Free Roads Association, the group which filed referendum petitions suspending the new toll road laws pending the outcome of a statewide vote on the issue. Question involved was whether the governor could compel preparation of ballot titles without waiting for their submission by the referendum movement sponsors.

One of the laws on which the election will be held would authorize three more toll roads—from Tulsa to the Missouri line on the way to Joplin; from Oklahoma City north to the Kansas line on the way to Wichita, and from Oklahoma City southwest to the Texas line on the way to Wichita Falls. The other act authorizes use of state highway funds for toll road surveys.

PENNSYLVANIA: State Turnpike Commission officials have indicated a quarter-billion-dollar, 125-mile northeast extension of the Pennsylvania Turnpike system is being scheduled for financing in January and construction early in 1954.

Connecting Wilkes-Barre and Scranton with Philadelphia via the Allentown-Bethlehem area, the new highway will also extend northward from Scranton to the state line near Binghamton for a connection with the New York State Thruway.

Expected to require nearly $250,000,000, including costs of financing and acquiring right-of-way, the northeastern extension in terms of dollars will be the largest single public works project ever undertaken by an agency created by the Pennsylvania legislature. The total cost is expected to equal or exceed that of all prior Pennsylvania Turnpike construction lumped together.

The Pennsylvania commission already has nearly $250,000,000 in outstanding indebtedness, but the new bonds are expected to find a ready market since the commission is now seven years ahead of schedule in retiring present debt due to toll road traffic far in excess of forecasts.

Estimated costs of the new extension are based on experience in connection with the present construction of the 33-mile eastern extension from King of Prussia to the Delaware River, which is scheduled for completion in less than a year at a cost of $65,000,000. The projected new extension will connect with the Delaware River link at a point between Valley Forge and the river.

Engineering surveys also are under way for another projected Pennsylvania Turnpike extension, which will run to Erie.

TEXAS: Following its approval of a tentative route for a toll highway between Dallas and Fort Worth, the Texas Turnpike Authority named a committee to negotiate a contract with Coverdale & Colpitts, New York engineering firm, to make an economic feasibility survey of the project. The committee also was empowered to retain other consultants to estimate the cost of the project's construction and maintenance.

The Texas authority also announced it would seek a court determination of the validity of the state's new toll road enabling act and the revenue bonds which would be issued under it. Exacted by the 1953 Texas legislature, the law gives priority to the proposed Dallas-Fort Worth project expected to cost $30,000,000.

Meanwhile, a "friendly" test suit was filed in the 101st District Court at Dallas by the Texas Turnpike Co. to determine whether property acquired by a private turnpike corporation in Texas is exempt from taxes. The suit asked that property acquired in Dallas County for a north-south toll road, to cost an estimated $150,000,000 or more, be declared public property not subject to taxation. This proposed turnpike would originate north of Gainesville, go near the limits of Grapevine, across about 20 miles of Dallas County to Midlothian near the city limits of Corpus Christi.

VIRGINIA: A meeting of highway planning officials of Virginia, North Carolina and West Virginia is scheduled to be held Feb. 8 in Roanoke for further consideration of the traffic load to be dispersed in Virginia and North Carolina when West Virginia completes construction of its 88-mile toll highway now being built between Charleston and Princeton.

Representatives of highway agencies of the three states, meeting Nov. 16 in White Sulphur Springs, W. Va., directed the New York engineering firm of Coverdale & Colpitts to proceed with a traffic study it has undertaken and to file a report on Jan. 1.

With completion of the West Virginia turnpike slated for early next fall, officials of Virginia and North Carolina want information on traffic potentials in their states so that the plans for construction of additional toll or free highways can be fitted into a regional pattern. North Carolina, through its State Turnpike Authority, is planning toll highway construction, but Virginia highway officials have been said to favor improvement of free roads as a means of handling additional traffic generated by the West Virginia project.

Building the $11,000,000 Garden State Parkway bridge over the Raritan River near Perth Amboy. Giant floating cranes and mixers supply concrete to cofferdams as the 4400-ft. structure takes shape. The contractor is the Frederick Snare Corp.

Athough reportedly cool to a toll road for southwest Virginia, the Virginia Highway Commission favors the enactment by the 1954 legislature of a measure to create a special toll road authority for construction of a Richmond-Petersburg toll road passing through those two cities.

WEST VIRGINIA: An official estimate of how much more money it will take to complete the West Virginia turnpike was delayed, but figures made public indicated that original construction cost predictions already have been exceeded by more than $20,000,000.

A quarterly report to trustees by the West Virginia Turnpike Commission revealed that construction contract commitments as of Sept. 30 totaled $59,085,182—a figure that didn't include the $19,509,760.50 for pavement contracts awarded in October. Nor did it include about $1,430,000 that will be required for guard rails and interchange buildings. Other minor contracts remaining to be awarded included one for bridge lighting.

Construction contract commitments thus have passed the $80,000,000 mark that ranges about $20,000,000 higher than the $60,000,000 set out as construction costs two years ago in the prospectus prepared as a basis for marketing the initial $96,000,000 revenue bond issue.

Before setting the amount of a second bond issue, the commission was awaiting word from its consulting engineers, who asked for more time in which to estimate the total project costs. No indication has been given as to the amount of the prospective second bond issue, which is expected to be sold sometime next spring.

WISCONSIN: Constitutionality of Wisconsin's new toll road enabling act was upheld by the State Supreme Court. Enacted by the 1953 legislature, the law provided for the creation of the State Turnpike Commission to study and construct, if found feasible, a cross-state toll highway running from the Minnesota to the Illinois border. Engineering firms had not yet been selected at this writing for feasibility surveys.

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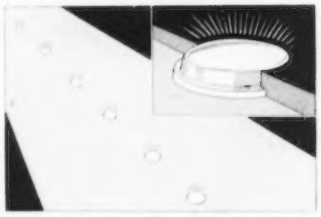

These dome-shaped, glazed vitreous ceramic pavement inserts have nearly twice the wearing qualities of granite. Easily installed in existing or new pavements, they provide all weather visibility both day and night. The glazed surface is so smooth and impervious that it sheds dirt and grime, keeping the markers always bright and conspicuous. Hardness and crushing strength are so great (24,000 lbs psi), that markers are immune to abrasion, shock and wear of the hardest traffic. Design permits sweepers, snowplows and traffic to glide over. White and yellow markers are available for crosswalks, center lines, lane and island markers. Color will not fade or become dull. These brilliant "Vitamic" markers are made so durable and strong they are more permanent than the road itself.

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SECTION NEWS

Missouri Valley

An informal meeting of the Missouri Valley Section of the ITE was held in Columbia, Missouri, on November 12, 1953, in conjunction with the Sixth Annual Traffic Engineering Conference of the University of Missouri. The primary purpose of this meeting was to hold an informal discussion on the planning for the Silver Anniversary Annual Meeting of the Institute of Traffic Engineers which is being held in Kansas City, Missouri, September 1954.

At the Traffic Engineering Conference at the University of Missouri, the Missouri Valley Section members of the ITE were happy to extend the hospitality of our Section to ITE members Harry Porter and Bryan Wilson, who were participants in the Conference program. In addition, Missouri Valley section President, Leon Corder, was the prime mover and mainstay of the Conference program.

Reported by W. W. Rankin
Secretary-Treasurer

New York Metropolitan Section

The third meeting for the 1953-54 fiscal year of the New York Metropolitan Section was held at the President Tavern at 6:30 P.M. on November 19 with 26 guests and members present.

Due to the absence of President Strickland (explanation to follow), Vice-President Nate Avins performed an excellent job of conducting our meeting. He introduced the speaker, Mr. Hugh Estes, Lighting Specialist with the General Electric Company, who added some very interesting commentary to a film presentation entitled "How to Light Streets." He intrigued us by presenting slide rules to the members for use in figuring out their intricate street lighting problems.

Brother Richard had good cause for being absent from our meeting as he was busy visiting his wife Ruth who had presented him with an 8-lb. 6-oz. youngster (their first) named David Lee, on Monday, November 16, at Woman's Hospital, New York City. Congratulations Dick and Mrs. Strickland!

Reported by Herbert J. Klar
Secretary-Treasurer

Washington, D. C., Section

The second dinner meeting of the 1953-1954 fiscal year was held in the Banquest Room of the Army and Navy Club on October 28, 1953. Sixty-five members and guests were present.

The principal speaker of the meeting was Mr. Harland Bartholomew, distinguished consultant, city planner and recently appointed by President Eisenhower as Chairman of the National Capital Planning Commission. Other distinguished guests and members included The Honorable Charles Dearing, Deputy Undersecretary of Commerce for Transportation; The Honorable Paul F. Royster, Assistant to the Undersecretary of Commerce for Transportation; Mr. Robert E. McLaughlin, Chairman of the Public Utilities Commission of the District of Columbia; Mr. James H. Flanagan, Vice-President of the Capital Transit Company; Mr. Charles W. Prisk, Vice-President, Institute of Traffic Engineers; Mr. John B. Ecker, former Director, Institute of Traffic Engineers; and Mr. Robert S. Holmes, recently elected Director, Institute of Traffic Engineers.

Mr. Bartholomew presented an extremely interesting and thought provoking paper on the "Plan of Washington." Included in Mr. Bartholomew's remarks were topics on the growth of the American city, the changed structural form of the modern city, how much traffic can be expected and what should we plan for, the function of the major street and thoroughfare plan, the function of mass transportation, and the comprehensive plan of Washington as the National Capital.

A question and answer period followed.

Reported by B. H. Sexton
Secretary-Treasurer

Southern Section

From the first newsletter sent out in November 1953:

All potential and existing members of the Southern Section, ITE, are cordially invited to attend the 15th Annual Southern Safety Conference and Exposition, March 7, 8, and 9, 1954, in Louisville Kentucky.

Our section now has 23 paid members. The potential membership is 73, not including potential "Local Section Affiliates." Join and encourage your ITE friends in our jurisdiction to do likewise. The dues are only $1.00 through March, 1954. You are needed and will be welcomed in this new professional organization designed to pro-

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"We have found them very serviceable and the maintenance cost on them is very low"

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. . . Mr. Treasurer for those kind words

G. A. HALE
PRESIDENT OF
MAGEE-HALE PARK-O-METER CO.

The two statements quoted above are from a letter written by Robert T. Eichmann, Treasurer of the Village of Rockville Center, Nassau County, N. Y. Rockville's 1100 Park-O-Meters had paid for themselves and Mr. Eichmann's letter accompanied the final payment under the contract. More than 1,000 cities, towns and villages are enjoying this same experience with Park-O-Meters.

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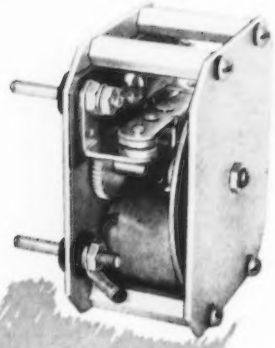
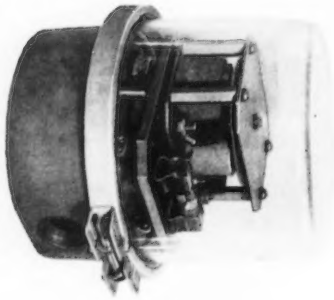
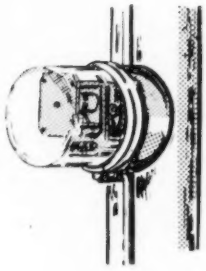
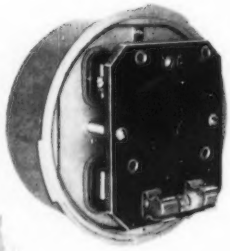


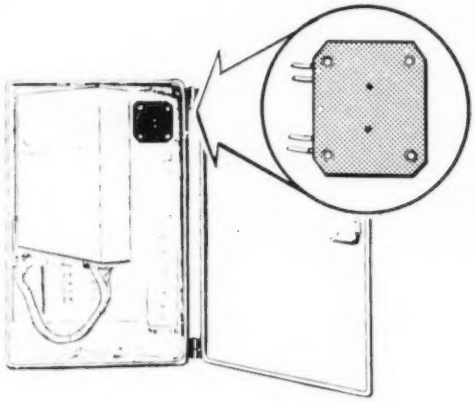




- Ball bearings throughout.
- Heavy ½" silver contact points.
- Rugged Induction Disk motor.
- Variable speed motor.
- Sturdy, compact construction.
- Roller actuated contact finger.



Jack mounted flasher with separate jack mounted panel is positioned in standard glass covered meter housing. Flasher is quickly accessible for easier maintenance.



Compact jack mounted flasher unit is designed for easy installation in the Eagle Controller.

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CORPORATION *Moline, Illinois*

mote the standards of traffic engineering and the men engaged therein.

From Virginia:

Virginia State Police Captain W. L. Groth (Affil. ITE) has been busy preparing his annual seminar lecture which is to be delivered to students of the Yale Bureau of Highway Traffic.

Kenneth Wilkinson, Assistant Traffic and Planning Engineer, Virginia Department of Highways, during the November 16-18 conference, delivered a talk to the Southern Association of State Planning and Development Agencies in Asheville, North Carolina.

J. P. Mills, Jr., Traffic & Planning Engineer (Mem. ITE), and Burton Marye, Jr., Assistant Chief Engineer recently attended a tri-state conference to determine and anticipate the affect of the West Virginia Turnpike on Virginia and North Carolina highways.

M. B. McReynolds (Jr. ITE), formerly Assistant Traffic Engineer of Richmond, Virginia, recently organized the Traffic Engineers Supply Company and has been awarded a contract to provide and install a modernized fixed time traffic control signal system for Fairmont, West Virginia.

Bill Gordon, Leslie H. Dawson (Jr. ITE) and Kenneth Wilkinson of the Virginia Department of Highways met recently with John T. Hanna (Assoc. ITE) City Traffic Engineer of Richmond, Virginia, to agree on final details for permanent traffic counters to be installed permantently at five Richmond intersections. The Highway Department will pay the total cost of the equipment and installation. The City of Richmond agrees to maintain the counters and to supply each of the 24 hour daily counts once each month.

Florida Reports

The Engineering Committee at the Fifth Annual Florida Highway Safety Conference, held in Jacksonville September 11-12, strongly recommended adoption of the Florida Manual of Uniform Traffic Control Devices for Streets and Highways as the standard of operation and maintenance of traffic control signals, signs and pavement markings on streets and roads throughout the state. It also recommended that all governmental units provide an adequate program for studying traffic problem locations and that geometric designs concerning streets and highways be submitted to the traffic engineering agencies having jurisdiction, for study and recommendation before detailed plans are prepared.

This committee restated its recommendation made formerly that each city of 50,000 population or over establish the office of Traffic Engineer directly subordinate to the Chief Officer of the City Engineering Department or other agency with engineering responsibilities.

The Institute of Traffic Engineers will be represented at the 1953 Highway and Surveying Conference to be held at the University of Florida on November 19-20 by Fred Burggraf, (Affil. ITE) and Earl J. Reeder (Mem.,ITE). Mr. Burggraf will talk on "Highlights of the Highway Research Board Activities." Mr. Reeder will speak on "The Traffic Engineer Looks Ahead."

Edmund Friedman, (Mem. ITE), Miami, is Vice President of the American Society of Civil Engineers, Zone II. This zone includes 12 states in the eastern and southern part of the country, extending from Pennsylvania to Alabama, inclusive. He was formerly Director from District 10.

Rader Engineering Co. (Earl J. Reeder, Partner), Smith and Gillespie and Howard, Needles, Tammen & Bergendoff have reported to the State of Florida on the feasibility of the 110 mile toll turnpike extending north from Miami parallel to U. S. Highway No. 1, which passes through the coastal cities of Florida. This feasibility study, which was authorized by the last session of the Florida Legislature, showed that this proposed expressway would render an important service in carrying the heavy through traffic away from the congested cities along this section of the Florida coastline and would be economically feasible.

Julien H. Harvey, (Hon. Member ITE) has left the jurisdiction of the Southern Section at Pass-A-Grille, Florida to become executive director of the New Haven Safety Council, New Haven, Connecticut. After a long and successful management of the Accident Prevention Department of the Association of Casualty and Surety Companys in New York, Julien had retired, but his long years of experience were greatly needed in New Haven. We wish him a very successful management of the affairs of the New Haven Safety Council—so successful, in fact, that he can be spared again to enjoy the retirement which he had started.

Atlanta Report

Roy A. Flynt, (Mem. ITE) of the Georgia State Highway Department, Robert N. Grunow (Mem.ITE) of the Bureau of Public Roads and Marble J.

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Hensley (Jr. ITE) and Karl A. Bevins (Mem. ITE) of the City of Atlanta Traffic Engineering Department are busy reconciling the coordinating plans for the Atlanta Expressway and a major street system which is being developed by the City of Atlanta through its Municipal Planning Board, Harland Bartholomew Associates Consultants and the City Traffic Engineering Department. Marble Hensley, Assistant Traffic Engineer, has been in charge of the City of Atlanta Traffic Engineering Department's phase of the studies and work.

William S. Derrick, (Assoc. ITE), of the Georgia Highway Department, W. L. Thomas (Jr. ITE) and Karl A. Bevins of the City of Atlanta Traffic Engineering Department are developing specifications for signs for the new Atlanta Expressway.

Hawley S. Simpson, (Mem. ITE), of Simpson and Curtin Consultants in Philadelphia is completing a report on mass transportation for the City of Atlanta. Mr. Simpson's work is being done for a Transit Commission established by the Georgia State Senate at the last meeting of the Legislature to investigate the transit situation in the City of Atlanta and report back to the State Legislature at its next session which will convene on November 16, 1953.

The activities of the Parking Commission, the Transit Commission, the City Traffic Engineering Department, the Municipal Planning Board, the Metropolitan Planning Commission, the State Highway Department and the Bureau of Highway Roads regarding traffic matters are being coordinated in the City of Atlanta through a non-official committee known as the Transportation Planning Council.

From Savannah

Reports from Hadley R. Cammack, (Mem. ITE), and David B. Martin, (Assoc. ITE), of Savannah indicate that the Traffic Engineering program in Savannah is steadily gaining momentum.

Alabama

Dave Dabney, (Assoc. ITE) of Mobile writes:

"During a recent visit to New Orleans I saw the Southern Section President, Paul Ristroph, who was working hard on some geometric designs of the streets in connection with New Orlean's tremendous Union Passenger Terminal program. In his office at the same time was Johnny Exnicios of the New Orleans Department of Traffic Engineering. A visit to the City Traffic Engineering office revealed that Ken King was continuing his good work in handling the New Orleans traffic problems and was being ably assisted by a last year's Bureau graduate, Frank Heroy. I believe that if a serious investigation was conducted it would reveal that Ken would much rather research the traffic problem from the helm of the 'Marie Cornelie' his sailing yacht."

Reported by: John T. Hanna
Secretary-Treasurer

PUBLIC OPINION . . .

(Continued from page 125)

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Reference Notes

Do Flashing Beacons Reduce Accidents?

By Robert M. Wray (Associate Mem., ITE)

Principal Traffic Engineer, Kentucky Department of Highways, Frankfort, Kentucky

The Traffic Division of the Kentucky Department of Highways installed 29 flashing beacons during the year 1952 and 15 during the first eight months of 1953. These beacons were installed at locations where at least two of the warrants listed in the Uniform Manual were satisfied; however, more emphasis was placed on the accident warrant than the others.

The staff of the Traffic Division has been convinced for some time that the installation of flashing beacons at high frequency accident locations tend to reduce the number of accidents. This conviction is based on general knowledge of reduction in accidents at locations where the installation of beacons improved bad conditions; however, no records were kept; consequently, the Director of the Division instructed the writer to make a study of the accident records at locations where beacons were installed in 1952 and 1953 to obtain factual data that would substantiate this contention.

Six locations were selected for the study. Accidents from January 1, 1953, to date of installation were tabulated as "before." Accidents from date of installation through August 1953 were tabulated as "after." The summary of these tabulations shows 95 accidents in 208 months or .456 accidents per month before installation and 16 accidents in 64 months or .296 accidents per month after installation. This is a reduction in accidents of 35%.

The highest number of accidents "before" recorded at one location was at the intersection of US 27 and KY 92 at Pine Knot in McCreary County. The intersection is a flared "T" type in a rural area. Kentucky Route 92 is the stem of the "T" and approaches the intersection on a long tangent and flat grade and carries 1600 vehicles daily. US 27, the flange of the "T", is tangent at the intersection; however, on either side there is a light curve. Average daily traffic on US 27 is 2,000 vehicles per day. All approaches are in a 35 m.p.h. zone. US27 is posted with "Side Road" signs and KY 92 with "T" intersection, "Stop Ahead", and "Stop" signs. There were 7 accidents at the intersection in 1950, 7 in 1951, and 14 in 1952. A beacon, flashing red on KY 92 and amber on US 27, was installed January 14, 1953, and since then there have been no recorded accidents.

Conclusions

It is realized that reduction of accidents at locations where beacons have been installed is not conclusive proof that the installation reduced the accidents instead of some other reason. It is believed the studies to date contain enough evidence to prove that such installations do tend to reduce accidents at bad locations. These studies are to continue until such time as this fact definitely is established or refuted.

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BATES, Russell G. (Assoc.)
21571 Royal Avenue, Hayward, California.

BENNETT, Richard O. (Affil.)
Traffic Consultant, National Association of Automotive Mutual Insurance Companies, 20 No. Wacker Drive, Chicago 6, Illinois.

BERG, Ricardo Estrada (Affil.)
Managing Director, Asociacion Mexicana de Turismo, Balderas No. 36, Desp. 801, Mexico 1, D. F.

BRANIGAN, Daniel A. (Member)
District Traffic Engineer, Illinois Division of Highways 2-1451. SEND MAIL: 206 Crawford Avenue, Dixon, Illinois.

BULLOCK, George W. (Junior)
City Traffic Engineer. ROckwell 9-1231. SEND MAIL: 1725 No. Glenoaks Boulevard, Burbank, California.

FLEMING, Walter K. (Assoc.)
Assistant Manager, Virginia Transit Company, P. O. Box 1635, Richmond 13, Virginia.

GREEN, Forest H. (Member)
Engineer Consultant, 557, Ministerio de Obras Publicos, Bogota, Colombia, South America.

HALSEY, Maxwell (Member)
Executive Secretary, Michigan State Safety Commission, 429 West Michigan Avenue, Lansing, Michigan, 5-8144, Ext. 335.

HOWARD, Harry, Jr. (Assoc.)
City Traffic Engineer, 1468 Hendricks Avenue, Jacksonville, Florida.

KOCH, Charles W. (Junior)
830 West Sixth Street, Los Angeles 17, California.

REEDER, Earl J. (Member)
Partner, Rader Engineering Company, 500 Congress Building, Miami 32, Florida, 94741.

RUDY, Burton M. (Junior)
District Agent Traffic, Connecticut State Highway Department, District No. 1. SEND MAIL: 57 Linbrook Road, West Hartford, Connecticut.

SIMOFF, Abram (Junior)
Assistant Traffic Engineer, Essex County Highway Department, MItchell 2-7800, Ext. 228. SEND MAIL: 69 Portland Place, Montclair, New Jersey.

TUTTLE, Lawrence S. (Assoc.)
Automotive Safety Foundation, Room 252 Capitol Building, Charleston 5, West Virginia.

NEW MEMBER

Affiliate

Daniel L. Fennell
Executive Vice-President, Kansas City Public Service Company, 728 Delaware Street, Kansas City 13, Missouri.

Technical Division Activities

Report on the Activities of Department No. 2 — Professional Standards and Education for Traffic Engineering

THIS DEPARTMENT was established by the Board of Direction "to outline the curriculum of the traffic engineer's education, based on the needs of practicing traffic engineers, and to prepare the technical requirements of a traffic engineer so that they can be presented to State Professional Engineer License Boards."

The modern history of the Department dates to March 1, 1948, when its immediate predecessor, the Committee on Traffic Engineering Curricula and Education, was authorized by the Board to replace the old Committee on Traffic Engineering Education. In October 1948 the Codification Committee, which had been appointed by the Board to study the Institute's committee structure, recommended that the Committee on Traffic Engineering Curricula and Education be continued as one of the six committees to which all technical matters of the Institute would be referred. In its report to the Board, the Codification Committee set forth the purpose of the Committee on Traffic Engineering Curricula and Education as stated above. Although the Committee has since been made a Department and has also had its name changed, its purpose remains generally as originally conceived.

From 1948 through 1951, the work of the Committee on Traffic Engineering Curricula and Education was carried on in two subcommittees: (1) Professional Registration and (2) Traffic Engineering Curricula. In 1952, when the Committee became the Department of Professional Standards and Education for Traffic Engineering in the newly created Technical Council, the Department was reorganized to include three committees; (A) Professional Registration; (B) Civil Service Requirements for Traffic Engineering Positions; and (C) Philosophy and Principles of Traffic Engineering.

The change in name from Traffic Engineering Curricula and Education to Professional Standards and Education for Traffic Engineering was made to recognize more specifically its activity pertaining to the professional registration of traffic engineers. This change was inspired in part by the excellent work of the Subcommittee on Professional Registration in 1951 under the chairmanship of Mr. J. C. Young, then Traffic Engineer for the California Division of Highways. Following a comprehensive survey of the Institute's entire membership to determine the professional registration status of each member, the subcommittee prepared a report which was presented as a technical paper during the 1951 Annual Meeting in Los Angeles. (The report is included in the 1951 Proceedings.) Subsequently the Board of Direction adopted as Institute policy the recommendations of the Subcommittee contained in this report.

The former subcommittee on Traffic Engineering Curricula, now the Committee on Civil Service Requirements for Traffic Engineering Positions, also did excellent work in 1951 under the Chairmanship of Mr. Donald S. Berry in preparing a report on educational requirements for traffic engineers. A questionnaire survey was made of the minimum education and experience requirements for the lowest professional grade of engineers employed in traffic engineering in cities over 50,000 population. The survey included questions about the scope of civil service examinations for such positions. The Subcommittee also investigated the kinds of courses and curricula that were being offered in engineering colleges to prepare young engineers for the beginning practice of traffic engineering. The findings and recommendations of the Subcommittee were reported at the 1951 Annual Meeting as a technical paper which is included in the Proceedings for that meeting.

At the 1952 Annual Meeting in Chicago the year's work of the new Committee on Philosophy and Principles of Traffic Engineering, under the Chairmanship of Professor Lloyd F. Rader, was presented as a group of technical papers, all included in the 1952 Proceedings. Currently this Committee under the chairmanship of Professor Fred Hurd is undertaking the task of establishing the policies and principles which are commonly accepted by Traffic Engineers but which have not previously been formalized in writing.

The work of all three Committees is, by virtue of their responsibilities, of a continuing nature. Recently the Committee on Professional Registration, under the Chairmanship of Mr. George Webb, Traffic Engineer for the California Division of Highways, was given the opportunity to present the Institute's policy on registration to the National Council of State Boards of Engineering Examiners at an October meeting in San Antonio, Texas. This opportunity came through the offer of the President of the California Board of Registration for Civil and Professional Engineers to bring up the matter of registration for traffic engineers before the National Council if he could be furnished with a description of the work which traffic engineers do. Such a description was prepared on the basis of the report prepared and adopted in 1951. The principal purpose of the Committee is now to disseminate information on Institute registration policy through grasping such opportunities as this.

The Committee on Civil Service Requirements plans to continue its study of the education requirements for the various professional grades of the practice of traffic engineering and to examine engineering curricula in the light of these requirements. A revision of the 1951 report is contemplated for the current Institute year.

NORMAN KENNEDY
Department Head

TRAFFIC PRODUCTS AND NEWS

New York City to Save $45,000 a Year On New Signal Posts

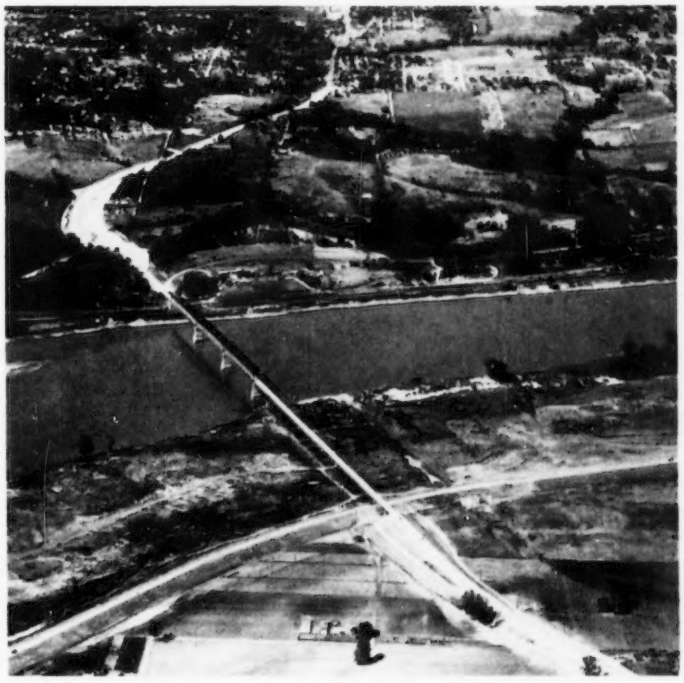
A new design of traffic signal post, estimated to save the city at least $45,000 per year, was recently installed in New York City. The new signal post, made of aluminum, will be used on new signal installations, modernization of old installations, and eventually for maintenance replacements of old style posts as they wear out.

The old style signal post is not readily adaptable to mounting modern adjustable types of traffic signals. It is held together by two sets of steel rods which are subject to severe rusting and break apart under small impact. The old post is made of 42 different parts which must be assembled before erection. It is made of cast iron which has poor shock resistance and weighs 232 pounds.

The new post is made of aluminum tubing with a cast aluminum base. It tapers from a four inch diameter at the top to approximately six inches at the base with a smooth satin finish. Instead of 42 parts, it is constructed as a single unit requiring no assembly. The new base weighs only 60 pounds and can be handled easily by one man for construction purposes.

1330 of the new posts have been purchased at a price of $48.80, in contrast with the latest price of $73.91 for the old type. An additional savings of approximately $10 in erection and shop assembly cost will be realized. As the City uses over 1300 posts per year, an annual savings in excess of $45,000 will be attained. Additional savings due to lower maintenance cost over the years is also anticipated. The low bidders for these new posts were the Pfaff & Kendall Company of Newark, New Jersey.

"This new aluminum traffic signal post is an important design improvement made by Department of Traffic engineers to give the City of New York the most up-to-date and economical types of equipment," Commissioner Wiley stated. "In addition, it will enable us to mount signals several inches higher than the old ones and to use modern up-to-date signal arrangements on the posts so as to produce greatly improved signal visibility for the motorist. Thus we expect to achieve both greater economy and greater safety."



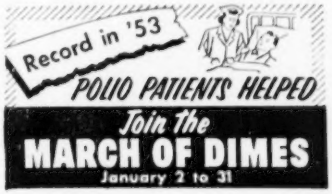
New River Crossing At Kansas City

Formal dedication ceremonies September 17, 1953, marked opening to motor vehicle traffic of the Chouteau Bridge between Kansas City and North Kansas City. The bridge, shown in this aerial view with the Kansas City end in the foreground, was built originally as a railroad span in 1887, the second across the river at Kansas City. It remained in service until 1945, then was purchased by Kansas City in 1950 for conversion into a vehicular traffic link. The work was done at a cost of $1,680,615.86. The Commission has constructed a 1.1 mile 24 foot portland cement concrete pavement approach to the new traffic facility on the Clay county side, designated as Route 269 and connecting with Route 10. The bridge was named for the Chouteau family, which pioneered settlement of the Mississippi Valley and established one of the first trading posts in the Kansas City area.

Holophane Official Dies

Stuart R. Williams, Vice-President in Charge of Manufacturing and a Director of Holophane Company, Inc., died after an operation, at Newark, Ohio. 1929. He was 55 years of age.

Mr. Williams joined Holophane in 1929. He was appointed Manager of the Street Lighting Department in 1936, Assistant Works Manager in 1941, and Vice-President in Charge of Street Lighting in 1948. A past president of the Central Ohio Society of Professional Engineers and a member of the National Society of Professional Engineers, he has contributed many articles on Safety Lighting, and was a well-known lecturer on illuminating engineering subjects. Mr. Williams, an outstanding authority in the field of Street Lighting, was an active member of the Street Lighting Committee in the Illuminating Engineering Society.



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Snip — Name _____ Title _____ — Snip

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29.

Street Lighting Catalog No. 95 Can Help You

This catalog, titled *Wheeler Street Lighting Equipment*, includes a line of products for all common sizes of lamps used on either series or multiple lighting systems. WHEELER Street Lighting Fixtures incorporate exclusive WHEELER features of design and construction, including the widely accepted screw ring reflector attachment. For street lighting help write to:

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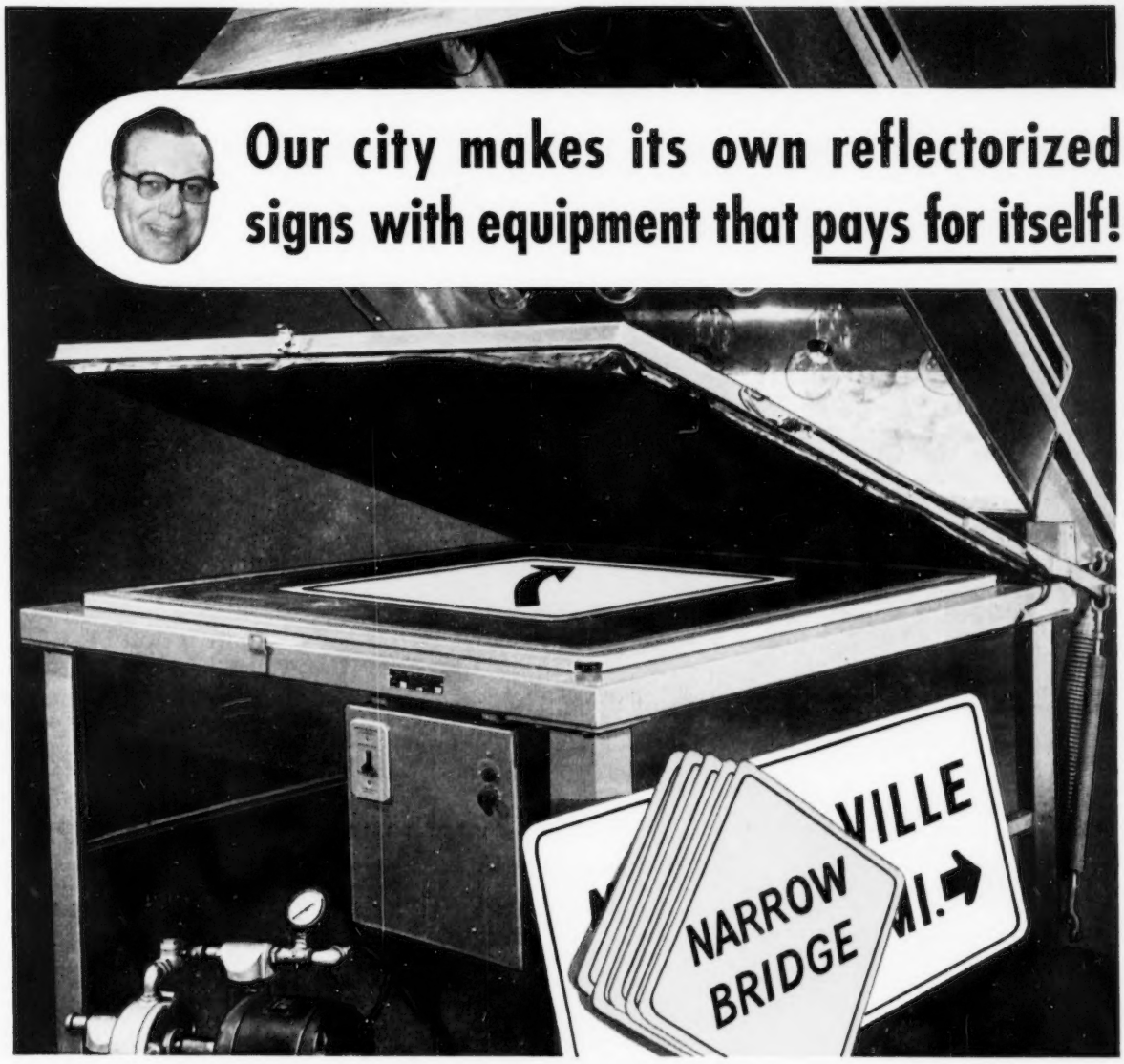
BOSTON 10, MASS.



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- 6 Left turn symbols "Scotchcal" Film
- 6 Right turn symbols "Scotchcal" Film
- 6 "Narrow Bridge" cut out letters, "Scotchcal" Film
- 25 Sets border stripes "Scotchcal" Film (4 per set)
- 3 Templates (1 Narrow Bridge, 1 Stop Ahead, 1 Right & Left Turn symbol)

FREE diagram of model sign shop.

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FEBRUARY 3-5, 1954—LOS ANGELES, CALIF.
Sixth California Street and Highway Conference, University of California at Los Angeles.

FEBRUARY 17-19, 1954—WASHINGTON, D. C.
Whitehouse Conference on Highway Safety.

MARCH 7-9, 1954—LOUISVILLE, KENTUCKY
Southern Safety Conference and Exposition, Kentucky Hotel.

MARCH 22-23, 1954—BOSTON, MASS.
33rd Annual Safety Conference of the Massachusetts Safety Council. Hotel Statler.

MAY 4-6, 1954 — WASHINGTON, D. C.
Fifth Highway Transportation Congress, Mayflower Hotel.

SEPTEMBER 27-30, 1954 — KANSAS CITY, MO.
25th Annual Meeting, Institute of Traffic Engineers, Muehlbach Hotel.

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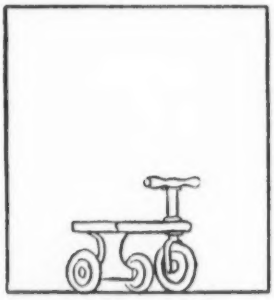
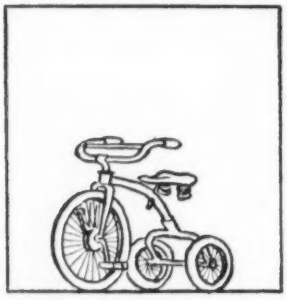
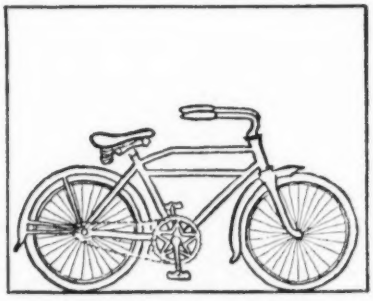


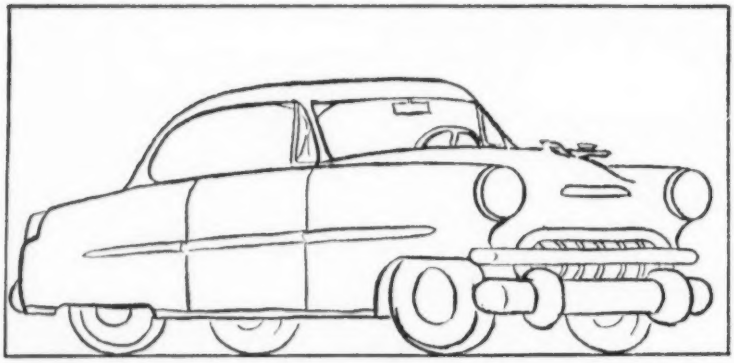
Baby



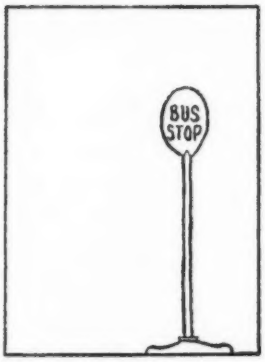
Sister



Junior



Mama



Papa

Courtesy Harrison 20-20

Obituary

R. Wayne Morris (Assoc. Mem., ITE) passed away at 6:30 P.M. December 7th, 1953. Wayne became ill on December 6th and was

taken to the St. Joseph's Hospital, Phoenix, Arizona. His unexpected death meant the conclusion of a very worthwhile career in the traffic engineering profession. At the time of his death he was serving in his third year as the Principal Traffic Engineer for the Department of Public Works, Phoenix. Wayne was 44 years old and is survived by his wife, Elizabeth, a daughter, Antoinette, and his stepfather. He was born April 5th, 1909.

He was graduated from the University of Arizona in 1931 with a B.S. Degree in Chemistry. Following his college education he became actively engaged in city and county work. He served as Deputy County Engineer for Maricopa County, Arizona; and as Field Materials Engineer, City of Phoenix. In 1938 he joined the Phoenix Police Department in the traffic enforcement division. From 1947 to 1950 he was Captain of the Police Department, and was the Director of the Safety and Engineering Division. In 1950 he became the Principal Traffic Engineer.

As the first city traffic engineer for Phoenix, Wayne was responsible for the inauguration, analysis, and supervision of the one way street system, parking studies, speed checks, volume counts and other traffic studies employed in the City.

His strong and delightful personality will be long remembered by his many friends and fellow Institute members.

SECRETARY'S COLUMN

Receipt of the first newsletter of the Southern Section, most of which is published elsewhere in this issue, reminded us that until now no notice has been taken in TRAFFIC ENGINEERING of the formation of our newest local section, and we hasten to make amends. Our ommission was not intentional—it was due to an extremely busy schedule.

Prior to the Annual Meeting in Buffalo several of the southern—and erstwhile southern—boys decided an active local section should be set up to help spread traffic engineering gospel throughout Dixie where the field has remained fallow and uncultivated until quite recently. Mike Flanakin and Bob Holmes persuaded Paul Ristroph to spearhead the initial exploratory effort by sending to about 25 of the District 5 members a draft of a proposed Constitution and By Laws, with a call to assembly after the Buffalo Business Meeting for discussion of a new section.

The matter was somewhat complicated by the situation of the Florida Section which was organized in 1947, with about a dozen members. Since then, the section has lost membership by removals from the state and retirements from the profession until there were less than half a dozen members left to carry on. Following an exchange of correspondence these members concluded it would be in their best interest to consent to an inactivation of the Florida Section, with its territory being absorbed by the new section.

At the Buffalo meeting the section Constitution and By Laws were adopted and the requisite petition to the Board was signed by 18 members. Officers elected to serve until a formal election is held next March are: Paul L. Ristroph, New Orleans. President; Karl A. Bevins, Atlanta, Vice-President; and John T. Hanna, Richmond, Secretary-Treasurer. When the Board of Direction met October 1st the Southern Section was officially authorized and became a going concern.

Its territory includes the states of Virginia (except for that portion within 50 miles of Washington, D. C.) West Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Arkansas, Texas and, at the option of its resident members, Oklahoma. The latter is officially in the Missouri Valley Section territory so its inclusion in the Southern Section is only tentative. Subsequent events indicate that the members in Texas plan to organize their own local section, which will probably mean that Oklahoma will remain in the Missouri Valley Section.

The potential membership of the Southern Section when organized was 94 members plus as many local section affiliates as might desire to join. The secession of Texas, together with Oklahoma reduces the present potential to about 70 members for the Southern Section.

The new Section is an outgrowth of the traffic engineering section of the Southern Safety Conference which covers substantially the same area. The Southern's traffic engineering section was first organized in 1947 and in spite of some setbacks—no meeting was held one year—of late has continued to generate a growing interest in the field, evidenced by an increased attendance each year. It is the present intention of the organizers for the new Southern Section to hold its annual meetings in conjunction with the annual Southern Safety Conference and Exposition. The section's first annual meeting will be held during the Conference's get-together at the Kentucky Hotel, Louisville, Kentucky, March 7-8 and 9th, 1954.

We would be remiss indeed, if we failed to extend our heartiest congratulations and best wishes for a strong, growing and ever active Southern Section.

TIM TODD

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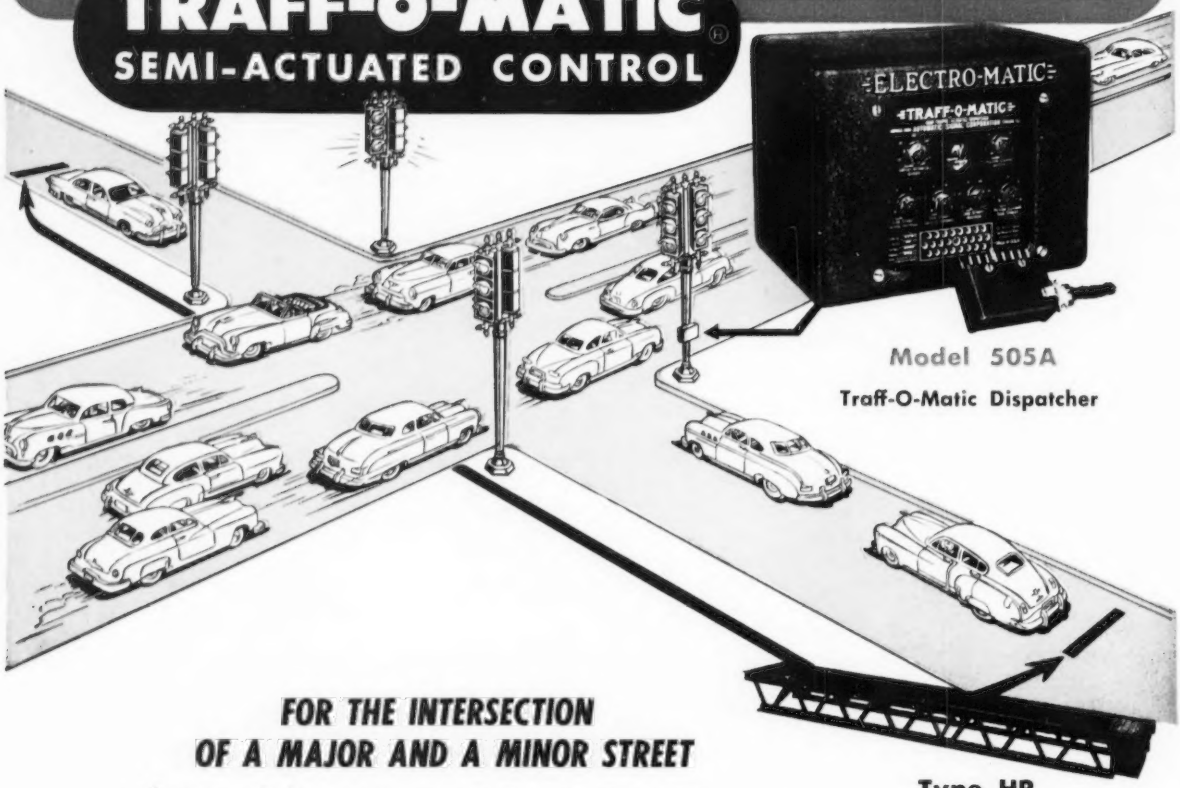

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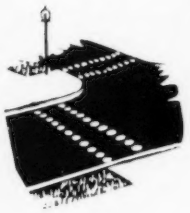

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